02-8910-03-SI
REV. NO. 0

FINAL SITE INSPECTION REPORT
AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY

PREPARED UNDER
TECHNICAL DIRECTIVE DOCUMENT NOS. 02-8805-04 AND 02-8910-03
CONTRACT NO. 68-01-7346

FOR THE

ENVIRONMENTAL SERVICES DIVISION
U.S. ENVIRONMENTAL PROTECTION AGENCY

OCTOBER 31, 1989

NUS CORPORATION
SUPERFUND DIVISION

SUBMITTED BY

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SITE NAME:	Aircraft Painting, Inc.	**EPA ID NO.:**	NJD096854229
ADDRESS:	Millville Municipal Airport Millville, New Jersey 08332	**LATITUDE:**	39° 22′ 29″ N
		LONGITUDE:	75° 04′ 23″ W
		BLOCK NO.:	631
		LOT NO.:	23

1.0 SITE SUMMARY

Aircraft Painting, Inc. is an active facility located in the former Boeing-Vertol hangar at the north end of the Millville Municipal Airport in Millville, Cumberland County, New Jersey. The surrounding area is generally flat and rural in nature, with the major population center located in the center of the city of Millville 2 miles northeast of the site.

Aircraft Painting, Inc. has been owned and operated since 1977 by Thomas and James Iwasz. Operations include the stripping and repainting of small aircraft. These activities take place inside a hangar that is leased from the City of Millville. The hangar is 65 feet wide and 165 feet long and has a cement floor that is slightly depressed to form a channel along the east wall, allowing for the accumulation of wash waters from the paint stripping process. Three floor drains, now plugged, are also located along the east wall in the channel. The concrete pavement outside and in the front of the hangar slopes gently downward to a storm drain 300 feet south of the hangar. The storm drain crosses the property from west to east, draining the adjacent airport properties and discharging eventually into a drainage ditch in a wooded area approximately 1200 feet north of the site.

Paint is removed from the airplanes either by the spray application of a solvent stripping agent or by sanding. The solvent used consists primarily of methylene chloride, but also contains ammonia, sodium chromate, and methanol. After the solvent has dissolved and removed the paint from an airplane, the plane is hosed down with fresh tap water or with previously used wash water. Three or four airplanes are stripped per month, using approximately 18 to 20 gallons of solvent per airplane. Prior to 1983, the company owners collected and disposed of the coagulated paint drippings into a garbage dumpster for disposal at the Millville Municipal Landfill. The wash waters were allowed to enter the floor drains located along the east wall of the hangar, which discharged into the storm drain 300 feet south of the hangar. In May 1982, the New Jersey Department of Environmental Protection (NJDEP) began an investigation into possible sources of alleged contamination in a Millville municipal well, identified as Airport Well No. 3, located several hundred feet southeast of the outfall of the storm drain into the drainage ditch. Data evidencing alleged contamination of Airport Well No. 3 is unavailable. The NJDEP identified Aircraft Painting, Inc. and the adjacent Airwork Corporation as potential sources of contamination. As a result of this investigation, the owners of Aircraft Painting, Inc. plugged the floor drains and began collecting the wash waters and paint sludges via a sump pump into a 4000-gallon steel tank on site. The NJDEP had collected a sample of this paint sludge in June 1982, but because the facility qualified as a small waste quantity generator, the sample was never analyzed. There is no indication that any groundwater samples were collected during the NJDEP investigation.

On August 2, 1988, NUS Corporation Region 2 FIT collected surface water and sediment samples from the drainage ditch north of the site and an aqueous sample from the solvent wash water storage tank on site. Groundwater samples were also collected from two municipal wells located at the Millville Municipal Airport. The analytical results of these samples indicated the presence of butylbenzlphthalate, bis(2-ethylhexyl) phthalate, 2-methylnaphthalene, phenol, tetrachloroethene, antimony, cadmium, and lead in the solvent tank as well as the surface water and/or sediment of the drainage ditch. In addition, tetrachloroethene at a concentration of 15 ppm and cadmium at a concentration of 6.2 ppm were detected in Airport Well No. 3. Both of these contaminants were present in the solvent wash water storage tank on site, and therefore may be attributable to the facility. Because of the close proximity of Airwork Corp., and the possibility that it may be responsible in some part for the contamination present, it is not possible to positively identify Aircraft Painting as the source of these contaminants.

Ref. Nos. 1-5, 22, 23, 24

2.0 SITE INSPECTION NARRATIVE

2.1 EXISTING ANALYTICAL DATA

During a site inspection of the Aircraft Painting facility by the NJDEP in June 1982, a sample was collected of the paint sludge produced by the paint stripping process. However, because the company qualified as a small waste quantity generator, the sample was never analyzed. Although the NJDEP targeted Airport Well No. 3 as allegedly contaminated as of May 1982, there are no data available evidencing contamination of Airport Well No. 3, prior to the analysis of samples taken during the August 2, 1988 Region 2 FIT site inspection.

Ref. Nos. 4, 5

2.2 WASTE SOURCE DESCRIPTION

The main waste source on site is a 4000-gallon aboveground steel tank located approximately 50 feet south of the Aircraft Painting, Inc. hangar along the east property boundary. The tank is used to store the chlorinated solvent wash waters generated by the paint stripping process. The tank is held in place by metal brackets underneath it, elevating the tank several inches above the concrete pavement. There are four 2-inch-diameter openings on the top of the tank which allow for evaporation of its contents. Because the tank is situated on a slight incline, the south end of the tank is slightly lower than the north end. There is no liner underneath the tank, nor are there any containment or diversion structures surrounding it.

Prior to 1983, the wash waters were allowed to enter the floor drains along the east wall of the hangar, which discharged into the storm drain south of the hangar. The storm drain eventually empties into a drainage ditch in a wooded area 1200 feet north of the Aircraft Painting, Inc. site. Based on field observations and information provided by the Millville Engineering Department, at least a portion of the drainage ditch is concrete-lined. The drainage ditch does not appear on the topographic map (Millville, N.J. Quadrangle), and there are no obvious migration pathways from the drainage ditch to a downslope surface water. For these reasons and because the contents of the drainage ditch may be percolating into the groundwater, the drainage ditch is considered to be a waste source. The addition of the drainage ditch as a waste source does not significantly increase the waste quantity.

It was noted during the site inspection that the concrete pavement between the Aircraft Painting, Inc. hangar and the storm drain was stained a grayish-green color. No sample was collected from the storm drain, however, as there was an insufficient quantity of water in the drain.

Ref. Nos 2, 4, 5, 6, 23, 24

2.3 GROUNDWATER ROUTE

The aquifer of concern is the Kirkwood-Cohansey aquifer system, a designated sole source aquifer, generally the shallowest source of groundwater throughout most of Cumberland County and the most important source of water in the county. It is composed primarily of the Kirkwood Formation and the Cohansey Sand, with locally distributed overlying Pleistocene deposits of the Bridgeton and Cape May Formations. The Kirkwood-Cohansey aquifer system is a predominantly unconfined aquifer, and underlies an area of approximately 3000 square miles in the coastal plain of southeast New Jersey. The lithology of the Kirkwood Formation varies from thick clay beds with interbedded zones of sand and gravel along the coast to an inland composition of fine to medium sand and silty sand, with regionally extensive clay beds occurring at the base of the formation. The overlying Cohansey Sand is coarser-grained than the Kirkwood Formation, and consists of a predominantly light-colored quartz sand containing minor amounts of pebbly sand, fine- to coarse-grained sand, silty and clayey sand, and interbedded clay. Some local clay beds within the Cohansey Sand are relatively thick. Perched water tables and semiconfined conditions may be present locally in the Kirkwood-Cohansey aquifer system.

Silt, sand, and gravel deposits of the Bridgeton Formation overlie the Cohansey Sand on the flatter upland areas and basin divides in the northern, central, and northeastern parts of Cumberland County. The Millville Municipal Airport is located on a deposit of Bridgeton Formation sediments. Reported thicknesses of the formation range up to approximately 50 feet. In much of the upland areas of Cumberland County, the Bridgeton Formation occurs largely above the water table. In these areas, it serves as a collecting unit for infiltrating recharge from precipitation to the underlying Kirkwood-Cohansey aquifer. Where the water table is within the Bridgeton Formation, the formation may yield small amounts of water to shallow domestic wells. The Bridgeton Formation consists of clayey silt, sand gravel, and thin layers of silty clay, with an estimated permeability of 10^{-5} to 10^{-7} centimeters per second.

The older Bridgeton Formation sediments were partially removed by erosion prior to the deposition of the Cape May Formation. The Cape May Formation consists of alternating layers of sand, clay, and fine gravel. A belt of Cape May deposits, ranging up to 2.5 miles wide, extends up the Maurice River Valley through Millville to about the Gloucester County line. The thickness of the Cape May Formation ranges up to approximately 120 feet in Cumberland County.

The total thickness of the Kirkwood-Cohansey aquifer system in the Millville area is approximately 325 feet, with the base of the unit occurring at an estimated depth of 250 feet below sea level. The permeability of the Kirkwood-Cohansey aquifer has been reported to be 2,700 gallons per day per square foot, or greater than 10^{-3} centimeters per second The depth to groundwater in the vicinity is generally less than 30 feet, although local variations occur. Groundwater flow is reported to be in a west to east direction. Net precipitation for the vicinity is approximately 10 inches per year.

Eight public supply wells located within a 3-mile radius of the Aircraft Painting, Inc. site and drawing from the Kirkwood-Cohansey aquifer serve approximately 24,500 persons in the city of Millville. Six industrial wells located northeast of the site draw from the Cohansey Sand, the upper water-bearing unit of the aquifer of concern. Numerous private wells used for domestic supply and irrigation are also located within 3 miles of the site. Table 1 summarizes the available well data and groundwater usage information for the public supply and major industrial wells within a 3-mile radius of Aircraft Painting, Inc. The available well data usage information can be found in References 11 and 12 of this report. As can be seen from this table, the Millville public supply wells Airport No. 1 and Airport No. 3 are the closest wells to the site, located 0.2 mile to the southwest and 0.2 mile to the northeast, respectively. During the site inspection by NUS Corporation Region 2 FIT on August 2, 1988, samples were collected from these wells to document the presence or absence of contaminants attributable to Aircraft Painting, Inc. The samples were collected from taps in the distribution lines from the well pumps. The analytical results of these samples indicated a value of 15 ppm of tetrachloroethene and 6.2 ppm of cadmium that might be attributable to the facility, in Airport Well No. 3 downgradient of the site. No tetrachloroethene was detected in Airport Well No. 1, which is upgradient of the site. Cadmium was present in Airport Well No. 1 below CRQL limits.

As previously mentioned, an investigation conducted by the NJDEP in 1982 to determine possible sources of alleged contamination in Airport Well No. 3 identified Aircraft Painting, Inc. as a potential contributor. However, there is no indication that any groundwater samples were collected during the NJDEP investigation, and there are no analytical data available evidencing contamination of Airport Well No. 3, prior to the analysis of samples taken during the August 2, 1988 Region 2 FIT site inspection. An NJDEP investigator noted during his field investigation that the drainage ditch into which the storm drain discharges had diminished in size downstream, "indicating that some of the flow had percolated to the groundwater." Current waste collection procedures at the Aircraft Painting, Inc. facility should minimize the potential for groundwater contamination to occur via such a route, as all wastes generated by the solvent stripping process are pumped into a 4000-gallon steel tank located on a concrete pavement. The practice of reusing the solvent wash waters and the evaporation process have maintained the quantity of wastes in the tank to its present volume of less than one-half full. If, however, spills or site runoff from this or the adjacent Airwork Corp. property were to enter the storm drain and discharge into the drainage ditch, the potential for groundwater contamination would be greatly increased, as the underlying geologic materials are highly permeable. Contaminants potentially attributable to the site already present in the ditch are listed in Section 4.0 of this report.

Ref. Nos. 1, 4, 5, 7-16, 21, 22, 23, 24, 25

Table 1

Groundwater Usage
within 3 miles of Aircraft Painting, Inc.
Millville, New Jersey

Name	Owner Identification Number	Distance from Site (miles)	Direction from site	Well Depth (feet)	Aquifer	Static Water Level (feet below ground surface)	Use	Population Served	Acreage Irrigated
City of Millville	Airport No. 1	0.2	Southwest	181	Kirkwood-Cohansey	94	Public Supply	24,500*	N/A
Millville, N.J.	Airport No. 2	0.3	Southeast	147	Kirkwood-Cohansey	64	Public Supply		
	Airport No. 3	0.2	Northeast	161	Kirkwood-Cohansey	78	Public Supply		
	Ware Ave. No. 13	2.1	Northeast	260	Kirkwood-Cohansey	Flowing	Public Supply		
	Ware Ave. No. 14	2.1	Northeast	120	Kirkwood-Cohansey	68	Public Supply		
	Ware Ave. No. 15	2.3	Northeast	131	Kirkwood-Cohansey	54	Public Supply		
	Ware Ave. No. 16	2.3	Northeast	86	Kirkwood-Cohansey	66	Public Supply		
	Bridgeton Pike	2.2	Northwest	118	Kirkwood-Cohansey	56	Public Supply		
National Can Corp.	1	2.1	Northeast	115	Cohansey	0	Industrial	N/A	N/A
Millville, N.J.	2	2.1	Northeast	108	Cohansey	17	Industrial	N/A	N/A
	3	2.2	Northeast	140	Cohansey	20	Industrial	N/A	N/A
Wheaton Glass	1	2.9	Northeast	132	Cohansey	Not Reported	Industrial	N/A	N/A
Millville, N.J.	2	3.0	Northeast	34	Cohansey	Not Reported	Industrial	N/A	N/A
	3	3.0	Northeast	34	Cohansey	Not Reported	Industrial	N/A	N/A

*All wells are interconnected and serve a total population of approximately 24,500

2.4 SURFACE WATER ROUTE

The Aircraft Painting, Inc. hangar is located at approximately 75 feet above mean sea level (MSL). The concrete pavement in front of the hangar slopes southward to a storm drain that crosses the site from west to east; all runoff from the site is intercepted by this storm drain. Site slope is less than 2 percent. Within a 3-mile radius of the site, there is a general decrease in elevation from approximately 90 feet MSL at the westernmost radial extent to 10 feet MSL along the Maurice River, 1.85 miles to the east.

There are no potentially affected downslope surface waters. The nearest downslope surface water is an unnamed stream located 0.8 mile south of the Aircraft Painting, Inc. hangar. All site runoff in the direction of this stream is intercepted by the storm drain located 300 feet south of the hangar. The drainage ditch into which the storm drain discharges does not appear on the topographic map (Millville, N.J. Quadrangle), and there are no migration pathways from it to a downslope surface water. For these reasons, and because the contents of the ditch may be percolating into the groundwater, the drainage ditch is considered to be a potential waste source rather than a surface water body.

The nearest major surface waters in the area are the Maurice River, located 1.85 miles east of the site, and Union Lake, located 2.1 miles northeast and upstream from the closest section of the Maurice River to the site. Union Lake was once used as a source of public water supply, but such use was abandoned in 1964 because of the inability to satisfactorily treat the water. Other designated uses of the Maurice River include the maintenance, migration, and propagation of the natural and established biota; primary and secondary contact recreation; industrial and agricultural water supply; and any other reasonable uses.

The nearest freshwater wetland is the Buckshutem Swamp 2.1 miles southeast of the site in an area designated as a state hunting and fishing grounds. There are no coastal wetlands within 2 miles and no critical habitats of federally listed endangered species within 1 mile of the site. One-year 24-hour rainfall for the area is 2.5 to 3 inches.

Ref. Nos 1, 2, 4, 12, 13, 17, 18, 19

2.5 AIR ROUTE

During the collection of the downstream sediment sample in the drainage ditch by NUS Corporation Region 2 FIT on August 2, 1988, readings of more than 10 parts per million (ppm) on the Organic Vapor Analyzer (OVA) and 7 ppm on the HNu photoionization detector (HNu) were detected in the first sample bottle filled for volatile organics analysis. As sampling continued, a strong organic odor and also a petroleum odor were noted by the samplers. Sampling activities were temporarily halted so that the samplers could don level B respiratory protection. When sampling resumed, readings of 8.5 ppm on the OVA and 7 ppm on the HNu were detected in the mixing bowl filled with sediments. A reading of 5 ppm was detected on the OVA in the ambient air at the downstream sample location.

At the upstream sample location, a reading of 2.2 ppm was noted on the OVA during the collection of the surface water sample. Because the level of detection on the OVA continued to rise, sampling was again temporarily halted so that the samplers could don the appropriate respiratory protection. Prior to the collection of the aqueous sample from the solvent wash water storage tank at the Aircraft Painting, Inc. Site, readings of 20 ppm on the OVA and 3 ppm on the HNu were detected at one of the openings on the top of the tank. Readings of 75 ppm on the OVA and 1.5 on an explosimeter were detected from the sample collected into the receiving flask. There were no readings on any of the instruments in the breathing zone.

The nearest historic landmark is located 2.4 miles northeast of the Aircraft Painting, Inc. facility and is not within view of the site. There are approximately 25,400 residents within 4 miles of the site.

Volatile and semivolatile contaminants present in the drainage ditch are listed in Section 4.0 of this report.

Ref. Nos. 2, 4, 20, 26

2.6 ACTUAL HAZARDOUS CONDITIONS

In May 1982, a representative of the New Jersey Department of Environmental Protection (NJDEP) conducted an investigation at the Millville Municipal Airport in an attempt to determine the source of alleged contamination in Airport Well No. 3. During the investigation, a gray-green discoloration of the bottom sediments in the drainage ditch was observed. The same discoloration was observed in two of the three immediately upstream manholes located along the storm drain which discharges into the ditch. The inspector also visited the Airwork Corp. and Aircraft Painting, Inc. facilities. At the latter, he noted that one of the planes in the hangar had been painted with what appeared to be a primer similar in color to that seen in the manholes and the drainage ditch. The Airwork Corp. facility included machine shops, assembly shops, plating shops, and testing areas for jet engines. No samples were collected during the NJDEP investigation in May 1982. Another inspector for the NJDEP visited the Aircraft Painting, Inc. facility in June 1982, at which time he collected a sample of the paint sludges generated from the paint removal process The sample was never analyzed, however, because it was determined that the operation qualified as a small waste quantity generator. A gray-green discoloration of the concrete pavement in front and downslope of the hangar was noted by

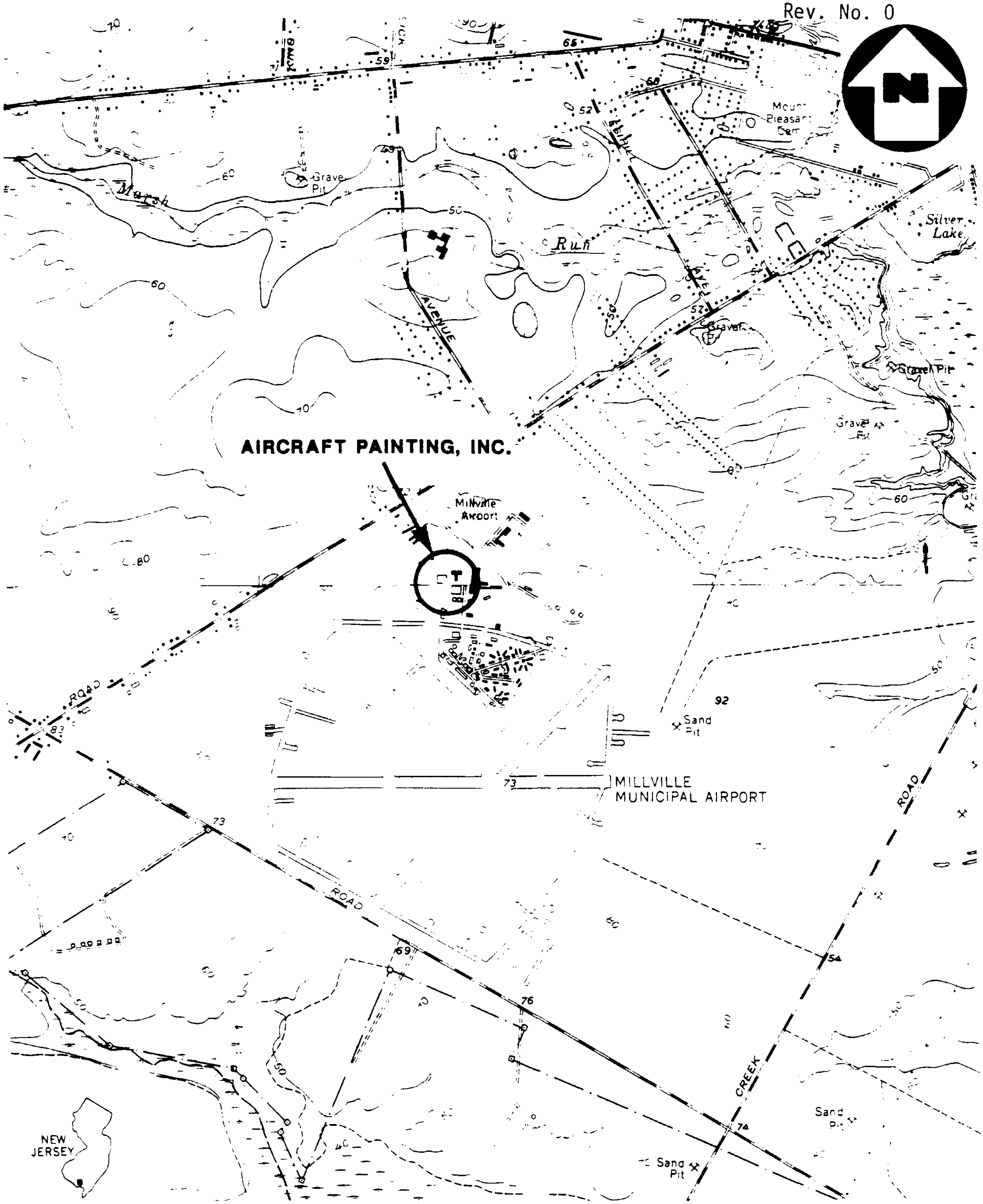
NUS Corporation Region 2 FIT personnel during the site inspection on August 2, 1988. Actual hazardous conditions exist at the site in relation to the evidence indicating the possibility of a release of tetrachloroethene and cadmium from the facility to the groundwater, which is present in Airport Well No. 3 at concentrations of 15 ppm and 6.2 ppm respectively, according to analytical results of the groundwater samples collected by NUS Corporation Region 2 FIT on August 2, 1988. A sample was not collected from the storm drain during the NUS Corporation Region 2 FIT site inspection conducted on August 2, 1988, as there was an insufficient quantity of water in the drain to allow for such sampling. However, contamination present in the drainage ditch downstream of the storm drain would indicate that the storm drain is contaminated. None of these contaminants can be positively attributed to the site because of the close proximity of Airwork Corp., which may have been responsible for all or part of the contamination. Although a fire marshal has not certified that the facility presents a significant threat, the reading of 1.5 on an explosimeter obtained during the NUS Corporation Region 2 FIT site inspection on August 2, 1988, indicated the potential for a fire or explosion in relation to the contamination present in the drainage ditch. There are no actual hazardous conditions pertaining to human or environmental contamination that have been documented in the following areas of concern:

- Contamination has not been documented either in organisms in a food chain leading to humans or in organisms directly consumed by humans.
- There have been no documented observed incidents of direct physical contact with hazardous substances at the facility involving a human being (not including occupational exposure) or a domestic animal.
- There have been no documented incidents of damage to flora (e.g., stressed vegetation) or to fauna (e.g., fish kill) that can be attributed to the hazardous material at the facility.
- There have been no analyses of soil samples showing above-background contamination that is attributable to the facility.

Ref. Nos. 4, 5, 23, 24

3.0 MAPS AND PHOTOS

AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY



(QUAD) DIVIDING CREEK, N.J.

FIGURE 1

SITE LOCATION MAP

AIRCRAFT PAINTING, INC., MILLVILE, N.J.

SCALE: 1"= 2000'

NUS CORPORATION

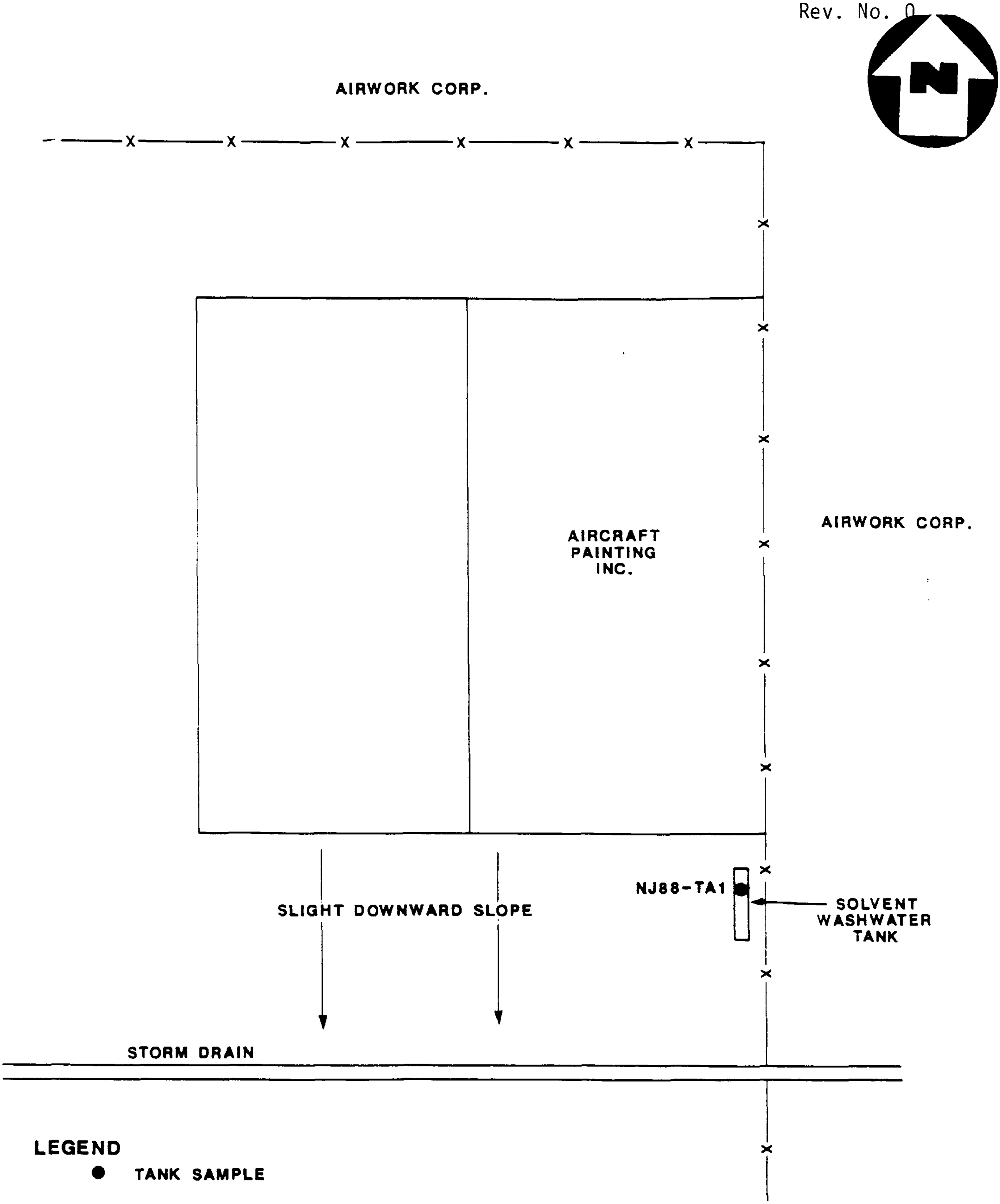


FIGURE 2

NUS CORPORATION

ON-SITE SAMPLE LOCATION MAP
AIRCRAFT PAINTING, INC., MILLVILLE, N.J.

(NOT TO SCALE)

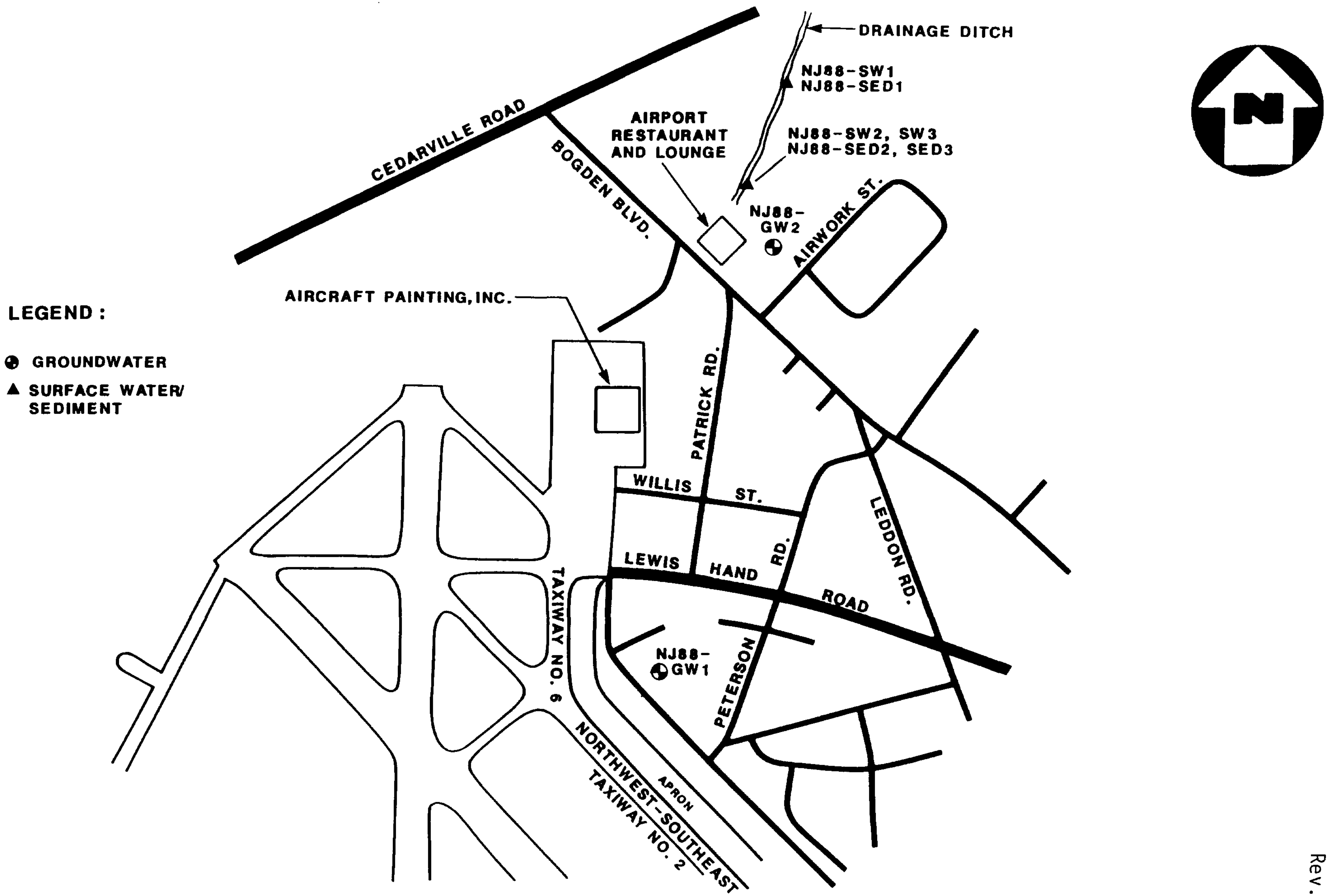


FIGURE 3

NUS CORPORATION

OFF-SITE SAMPLE LOCATION MAP

AIRCRAFT PAINTING, INC., MILLVILLE, N.J.

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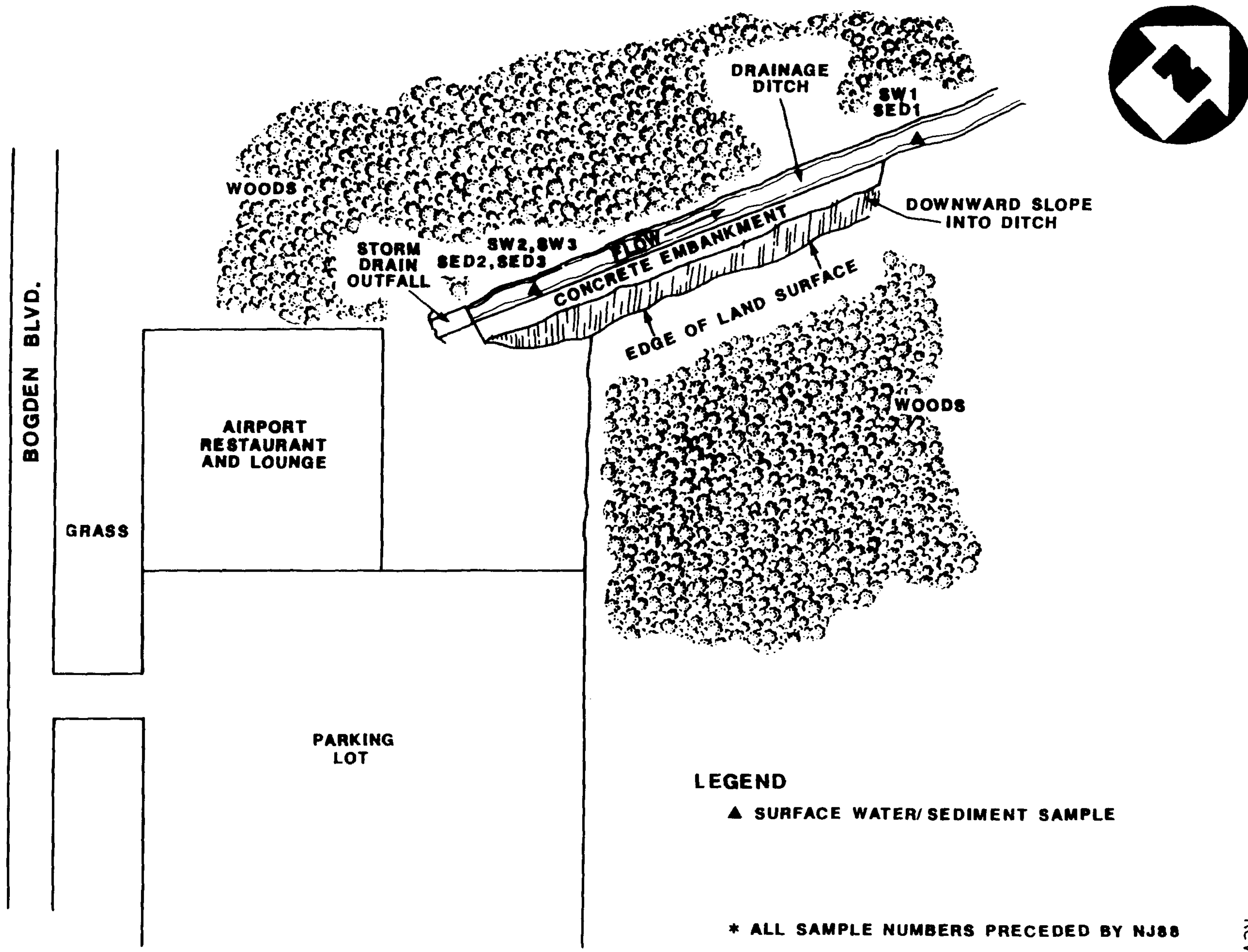

DRAINAGE DITCH SAMPLE LOCATION DETAIL MAP

AIRCRAFT PAINTING INC., MILLVILLE, N.J.

(NOT TO SCALE)

FIGURE 4

NUS CORPORATION

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EXHIBIT A

PHOTOGRAPH LOG

AIRCRAFT PAINTING,INC.
MILLVILLE, NEW JERSEY

JULY 19 and AUGUST 2, 1988

AIRCRAFT PAINTING.INC.
MILLVILLE, NEW JERSEY
JULY 19 and AUGUST 2, 1988
PHOTOGRAPH INDEX

ALL PHOTOGRAPHS TAKEN BY JOANN WAGNER

Photo Number	Description	Time
1P-9	July 19, 1988 View from the rear towards the front of the Aircraft Painting, Inc. hangar, showing the east wall along which floor drains are located.	1040
1P-10	July 19, 1988 East wall of the Aircraft Painting Inc. hangar, showing the location of one of the plugged floor drains (within the darkened area to the right of the step ladder), approximately 15 to 20 feet from the hangar door.	1043
1P-11	July 19, 1988 Storage tank into which solvent wash waters are pumped, located along the east side of the site, approximately 50 feet south of the hangar.	1048
1P-13	July 19, 1988 View of the storm drain that extends across the airport property 300 feet south of the Aircraft Painting,Inc. hangar, into which the floor drains in the hangar once discharged.	1047
1P-10	August 2, 1988 View of the discolored sloping pavement between the Aircraft Painting. Inc. hangar and the storm drain. Photo was taken while standing at the storm drain, facing north.	1825
1P-11	August 2, 1988 View along the storm drain, facing east towards the adjacent Airwork Corp. property. The storm drain extends across that property also.	1825
1P-14	July 19, 1988 Stan Shulfer and Kurt Fendler conducting reconnaissance of the storm drain outfall into the drainage ditch, located in a wooded area approximately 1200 feet north of the Aircraft Painting Inc. hangar and behind the Airport Restaurant and Lounge.	1143
1P-1	August 2, 1988 Kurt Fendler collecting surface water sample NJ88-SW1 from the downstream sample location in the drainage ditch into which the storm drain empties.	0905
1P-2	August 2, 1988 Kurt Fendler collecting sediment sample NJ88-SED1 from the same downstream location as NJ88-SW1.	1010
1P-3	August 2, 1988 Phil Solinski collecting surface water sample NJ88-SW2 from the upstream sample location in the drainage ditch near the storm drain outfall.	1110

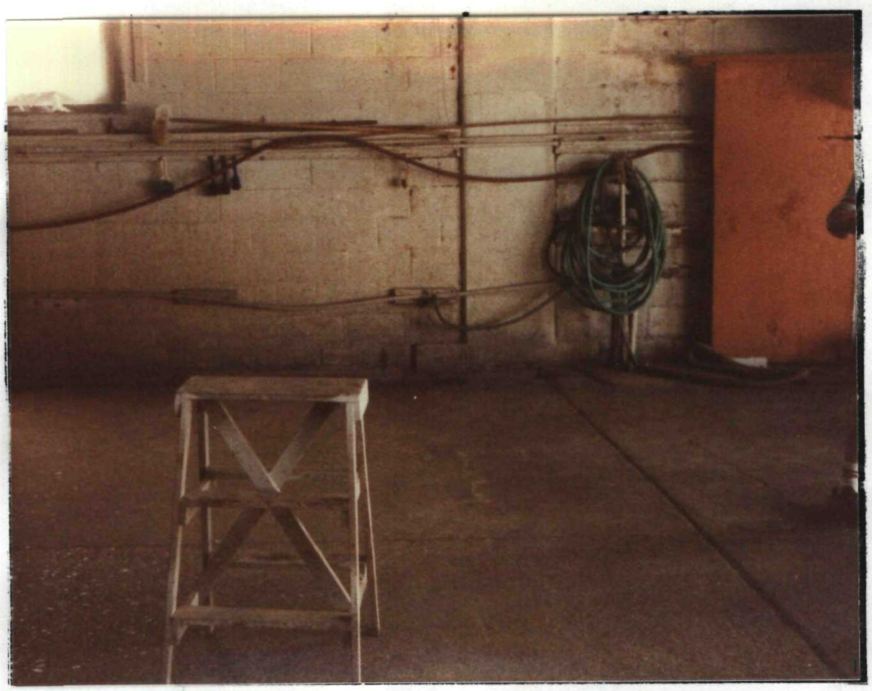
AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY
JULY 19 and AUGUST 2, 1988
PHOTOGRAPH INDEX (CONT)

ALL PHOTOGRAPHS TAKEN BY JOANN WAGNER

Photo Number	Description	Time
1P-4	August 2, 1988 Phil Solinski collecting surface water sample NJ88-SW3 from the same upstream location in the drainage ditch as NJ88-SW2 (SW3 is the environmental duplicate of SW2).	1135
1P-5	August 2, 1988 Kurt Fendler collecting sediment sample NJ88-SED2 from the same upstream location in the drainage ditch as NJ88-SW2.	1138
1P-6	August 2, 1988 Kurt Fendler collecting sediment sample NJ88-SED3 from the same upstream location in the drainage ditch as NJ88-SED2 (SED3 is the environmental duplicate of SED2).	1140
1P-7	August 2, 1988 Chris Casiere collecting downgradient groundwater tap sample NJ88-GW2 from Millville public supply well Airport No. 3.	1225
1P-8	August 2, 1988 Darrell Soo Hoo collecting upgradient groundwater tap sample NJ88-GW1 from Millville public supply well Airport No. 1.	1235
1P-9	August 2, 1988 Kurt Fendler collecting aqueous sample NJ88-TA1 from the solvent wash water storage tank at the Aircraft Painting,Inc. site.	1600

AIRCRAFT PAINTING,INC.
MILLVILLE, NEW JERSEY

1P-9 July 19, 1988 1040
View from the rear towards the front of the Aircraft Painting,Inc. hangar, showing the east wall along which floor drains are located.



1P-10 July 19, 1988 1043
East wall of the Aircraft Painting,Inc. hangar, showing the location of one of the plugged floor drains (within the darkened area to the right of the step ladder), approximately 15 to 20 feet from the hangar door.

AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY

1P-11 July 19, 1988 1048
Storage tank into which solvent wash waters are pumped, located along the east side of the site, approximately 50 feet south of the hangar.

1P-13 July 19, 1988 1047
View of the storm drain that extends across the airport property 300 feet south of the Aircraft Painting, Inc. hangar, into which the floor drains in the hangar once discharged.

AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY

1P-10 August 2, 1988 1825
View of the discolored sloping pavement between the Aircraft Painting, Inc. hangar and the storm drain. Photo was taken while standing at the storm drain, facing north.

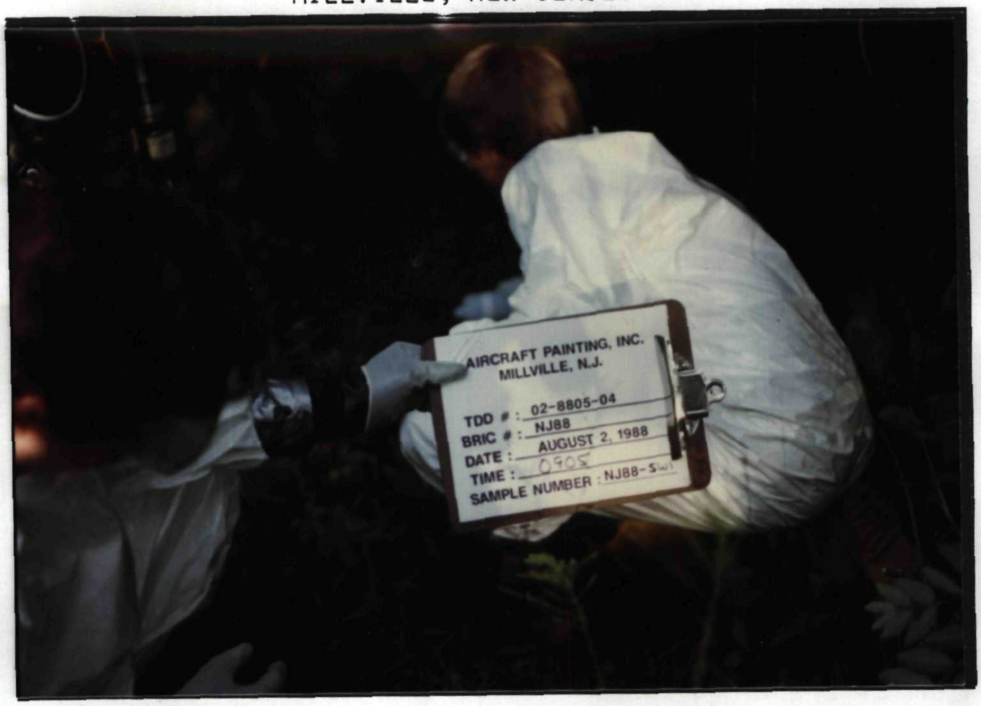
1P-11 August 2, 1988 1825
View along the storm drain, facing east towards the adjacent Airwork Corp. property. The storm drain extends across that property also.

AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY

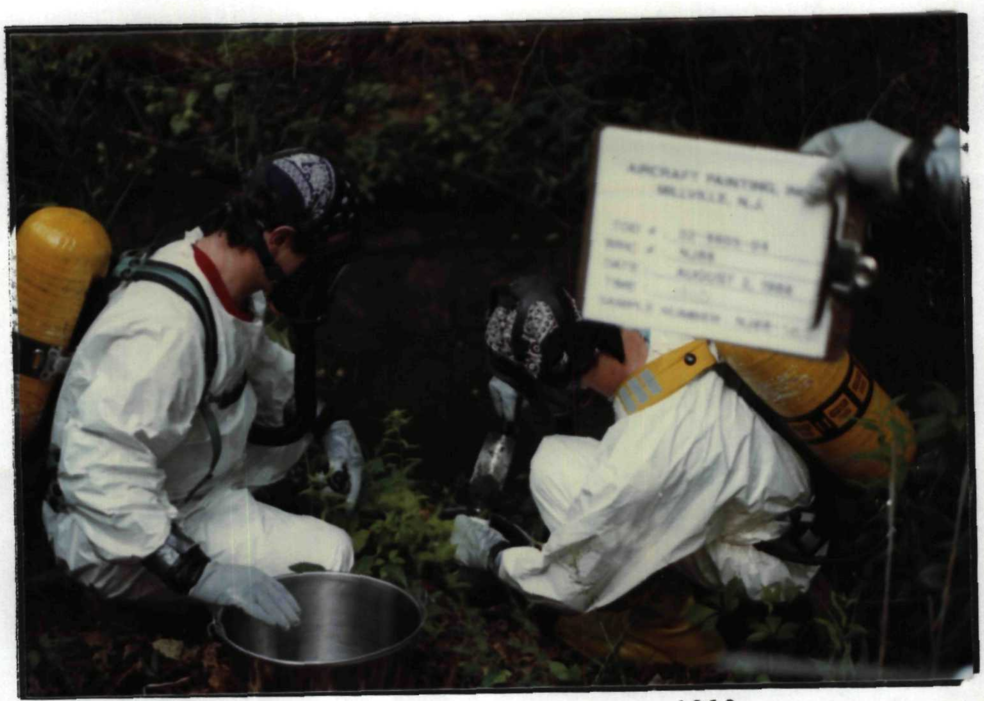
1P-14 July 19, 1988 1143

Stan Shulfer and Kurt Fendler conducting reconnaissance of the storm drain outfall into the drainage ditch, located in a wooded area approximately 1200 feet north of the Aircraft Painting, Inc. hangar and behind the Airport Restaurant and Lounge.

AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY



1P-1 August 2, 1988 0905
Kurt Fendler collecting surface water sample NJ88-SW1 from the downstream sample location in the drainage ditch into which the storm drain empties.



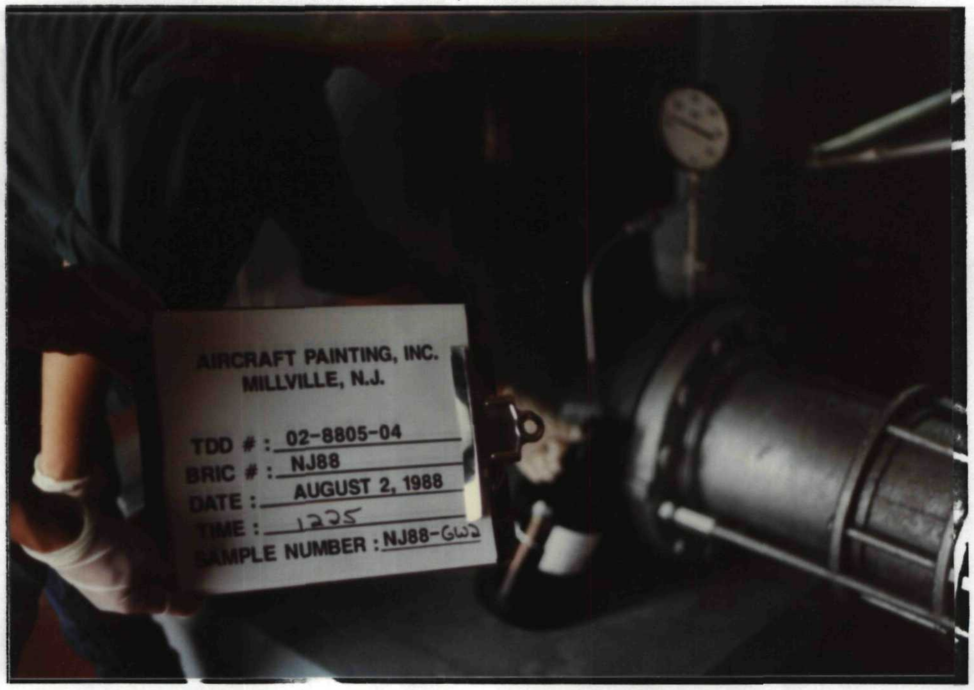
1P-2 August 2, 1988 1010
Kurt Fendler collecting sediment sample NJ88-SED1 from the same downstream location as NJ88-SW1.

AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY

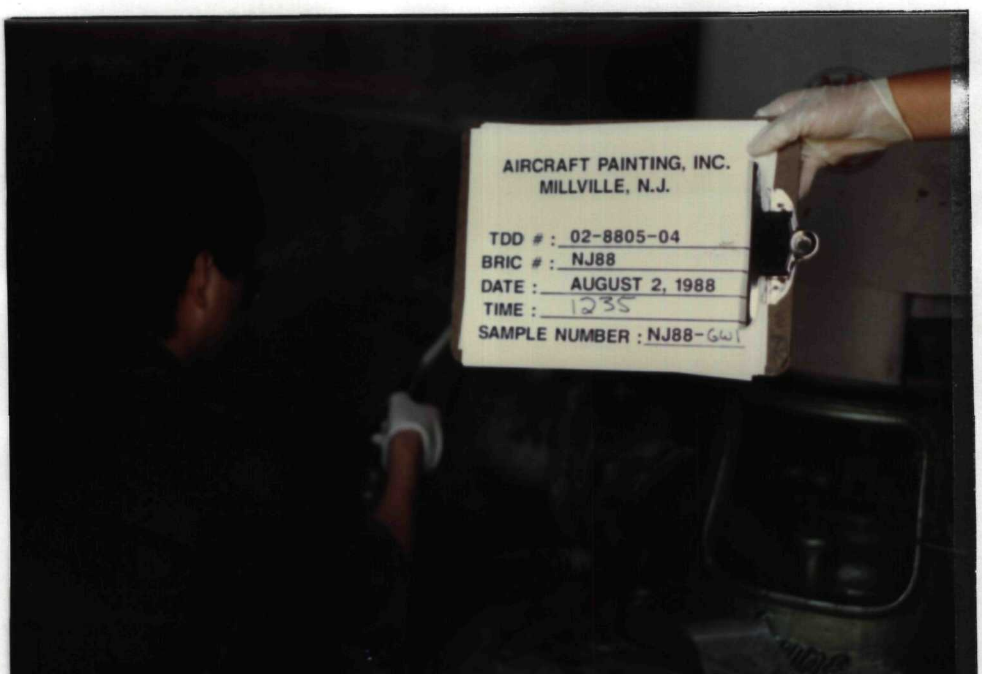
1P-5 August 2, 1988 1138
Kurt Fendler collecting sediment sample NJ88-SED2 from the same upstream location in the drainage ditch as NJ88-SW2.

1P-6 August 2, 1988 1140
Kurt Fendler collecting sediment sample NJ88-SED3 from the same upstream location in the drainage ditch as NJ88-SED2 (SED3 is the environmental duplicate of SED2).

AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY



1P-7 August 2, 1988 1225
Chris Casiere collecting downgradient groundwater tap sample NJ88-GW2 from Millville public supply well Airport No. 3.



1P-8 August 2, 1988 1235
Darrell Soo Hoo collecting upgradient groundwater tap sample NJ88-GW1 from Millville public supply well Airport No. 1.

AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY

1P-3 August 2, 1988 1110
Phil Solinski collecting surface water sample NJ88-SW2 from the upstream sample location in the drainage ditch near the storm drain outfall.

iP-4 August 2, 1988 1135
Phil Solinski collecting surface water sample NJ88-SW3 from the same upstream location in the drainage ditch as NJ88-SW2 (SW3 is the environmental duplicate of SW2).

AIRCRAFT PAINTING, INC.
MILLVILLE, NEW JERSEY

1P-9 August 2, 1988 1600
Kurt Fendler collecting aqueous sample NJ88-TA1 from the solvent wash water storage tank at the Aircraft Painting, Inc. site.

4.0 SITE INSPECTION SAMPLE RESULTS

NUS Corp. Region 2 FIT personnel conducted a site inspection of Aircraft Painting Inc. on August 2, 1988, during which aqueous, soil, and sediment samples were collected. The analytical results are presented in References 23 and 24 of this report. Sample locations are presented in Figures 2, 3, and 4 found in Section 3.0 of this report. These samples were analyzed to determine the presence of Target Compound List (TCL) substances which may be attributable to the site.

Analyses of groundwater samples indicate the presence of tetrachloroethene at a concentration of 15 ppb and cadmium at a concentration of 6.2 ppm in Airport Well No. 3, downgradient of the site. Both of these substances may be attributable to the site because of their presence in samples taken from the solvent storage tank on site and the drainage ditch. The absence of these substances in quantifiable amounts in Airport Well No. 1, upgradient of the site, further indicates the contaminants as possibly attributable to the site.

Three surface water and companion sediment samples were collected from the drainage ditch to document the presence or absence of contaminants in the ditch. Sample numbers NJ88-SW1 and NJ88-SED1 were taken 8 feet downstream of the end of a concrete embankment along the southeast side of the ditch. Sample numbers NJ88-SW2, NJ88-SED2, NJ88-SW3 and NJ88-SED3 were taken 10 feet downstream of the outfall of the cement storm drain into the ditch. Because of the nature of the drainage ditch it was not possible to obtain an upstream sample. In addition, an aqueous sample, NJ88-TA1, was collected from the storage tank on the Aircraft Painting, Inc. site to determine whether any contaminants in the drainage ditch, if detected, might be attributable to the Aircraft Painting facility. Delta - BHC, a pesticide, was present below quantifiable limits in sample NJ88-TA1 and at a concentration of 22 ppb in sample NJ88-SED1. Pesticides detected in the drainage ditch, but not in the storage tank are as follows: endosulfan I was present below quantifiable limits in sample NJ88-SED3, 4,4'-DDT was present at a concentration of 410 ppb in sample NJ88-SED2, 4,4'-DDD was present at a concentration of 170 ppb in sample NJ88-SED3, and gamma chlordane was present at a concentration of 26 ppb in NJ88-SED3 and below quantifiable limits in NJ88-SED2. Complete analytical data are in References 23 and 24. Additional analytical results of samples that indicate the presence of contaminants possibly attributable to the Aircraft Painting facility in the drainage ditch are listed as follows:

A. Volatile and Semivolatile Organics:

Substance	Sample No.	Concentration in ppb
Butylbenzlphthalate	NJ88-SED1	J
	NJ88-SED2	J
	NJ88-SED3	J
	NJ88-TA1	7,100 E
bis(2-Ethylhexyl)phthalate	NJ88-SW1	J
	NJ88-SED1	J
	NJ88-SED2	71,000 E
	NJ88-SED3	J
	NJ88-TA1	1100 E
2-Methyl naphthalene	NJ88-SED1	J
	NJ88-SED3	J
	NJ88-TA1	J
Phenol	NJ88-SED2	J
	NJ88-SED3	10,000 E
	NJ88-TA1	3,700 E
Tetrachloroethene	NJ88-SW1	J
	NJ88-SW2	J
	NJ88-SW3	J
	NJ88-TA1	J
	NJ88-GW2	15

B. Inorganics:

Substance	Sample No.	Concentration in ppm
Antimony	NJ88-SW1	60.9
	NJ88-SW3	75
	NJ88-TA1	4,630
Cadmium	NJ88-SW1	70.7
	NJ88-SED1	5.1
	NJ88-SW2	85.4
	NJ88-SW3	80.2
	NJ88-TA1	1,320 E
Lead	NJ88-SW1	155
	NJ88-SED1	1,370
	NJ88-SED2	243
	NJ88-SED3	419

E = estimated value
J = estimated value, compound present below CRQL but above IDL

5.0 CONCLUSIONS AND RECOMMENDATIONS

Sample analysis indicates contamination of surface water and sediments in an off-site drainage ditch by volatiles, semivolatiles, inorganics and one pesticide, which may be attributed to the facility. Airport Well No. 3 is contaminated with concentrations of 15 ppm of tetrachloroethane and 6.2 ppm of cadmium. Both of these substances may be attributed to the facility because of their presence in the drainage ditch and waste solvent tank. Because of the close proximity of Airwork Corp., and the possibility that it may be responsible in some part for the contamination present, it is not possible to positively identify Aircraft Painting as the source of these contaminants. Groundwater within 3 miles of the site serves approximately 24,500 people in Millville. For these reasons a Listing Site Inspection recommended for this site.

6.0 REFERENCES

1. Telecon Notes: Conversations between Tom Iwasz, Aircraft Painting, Inc., and Joann Wagner, NUS Corporation, July 22, 1988 and August 25, 1988.

2. U.S. Department of the Interior, Geological Survey Topographic Maps, 7.5 minute series, "Dividing Creek Quadrangle, New Jersey", 1956, photorevised 1972; "Millville Quadrangle, New Jersey", 1953, photorevised 1972; "Bridgeton Quadrangle, New Jersey", 1953, photorevised 1972; and "Cedarville Quadrangle, New Jersey", 1956, photorevised 1972.

3. Telecon Note: Conversation between Tom Iwasz, Aircraft Painting, Inc., and Joann Wagner, NUS Corporation, July 11, 1988.

4. Field Notebook No. 0284, Aircraft Painting, Inc., TDD No. 02-8805-04, on-site reconnaissance conducted on July 19, 1988, and site inspection conducted on August 2, 1988, NUS Corporation Region 2 FIT, Edison, New Jersey.

5. Preliminary Assessment Report, New Jersey Department of Environmental Protection (NJDEP), Hazardous Site Mitigation, Bureau of Environmental Evaluation and Risk Assessment, Trenton, New Jersey, January 1, 1985.

6. Airport Industrial Park Development, Rental Uniform Service of Millville, Inc. Engineering Department, City of Millville, Cumberland County, New Jersey. September 26, 1983.

7. Zapecza, O.S. Hydrogeologic framework of the New Jersey Coastal Plain, regional aquifer-system analysis. U.S. Geological Survey open-file report 84-730. Trenton, New Jersey, 1984.

8. *Rooney, J.G. Ground-water resources, Cumberland County, New Jersey. Special Report No. 34.* State of New Jersey Department of Environmental Protection, Division of Water Resources. Prepared in cooperation with the United States Department of the Interior Geological Survey, 1971.

9. State of New Jersey, Department of Conservation and Economic Development, Atlas Sheet No. 40, Geologic Map of New Jersey by J. Volney Lewis and Henry B. Kümmel, 1910-1912.

10. Freeze, A.R., and J.A. Cherry, Groundwater New Jersey, Prentice-Hall, Inc. 1979.

6.0 REFERENCES

11. N.J. Department of Environmental Protection, Division of Water Resources (DWR), Bureau of Water Allocation, (BWA), Water Withdrawal Points and NJGS Case Index Sites within 5.0 miles of Latitude 392229 and Longitude 750423, August 13, 1988.

12. Uncontrolled hazardous waste ranking system, A user's manual, 40 CFR, Part 300, Appendix A, 1986.

13. Hart, Diane E. Staff Report, in the matter of the City of Millville, Application No. 5316 to renew permit to divert water from eight existing wells in the City of Millville, Cumberland County, New Jersey Department of Environmental Protection, Bureau of Water Allocation.

14. Syed, Aziz. Staff Report, in the matter of Kerr Glass Manufacturing Corp., Application No. 2213P to renew permit to divert water from three wells in the City of Millville, Cumberland County, New Jersey Department of Environmental Protection, Water Allocation Office.

15. Syed, Aziz. Staff report, in the matter of Wheaton Glass Company, Application No. 2095P to renew permit to divert from 15 wells in the City of Millville, Cumberland County, New Jersey Department of Environmental Protection, Bureau of Water Allocation.

16. Project note from Joann Wagner, NUS Corporation, to file concerning records of wells within a 3-mile radius of Aircraft Painting, Inc., on file at the NJDEP, DWR, BWA, 401 East State Street, Third Floor, Trenton, New Jersey.

17. State of New Jersey Department of Environmental Protection, Division of Water Resources. Surface Water Classifications, Surface Water Quality Standards, N.J.A.C. 7:9-4, May 1985.

18. New Jersey Department of Environmental Protection, Division of Water Resources. Surface Water Quality Standards N.J.A.C. 7:9-4.1 et. seq., May 1985.

19. Endangered and threatened wildlife and plants. Department of the Interior, U.S. Fish and Wildlife Service. 50 CFR, 17.11 and 17.12, January 1, 1986.

20. U.S. Department of the Interior, New Jersey Registry of National Historic Sites and Landmarks. February 4, 1987.

6.0 REFERENCES

21. Telecon Notes: Conversations between Jack Harris, Millville Water Department, and Joann Wagner, NUS Corporation, July 22, 1988 and August 19, 1988.

22. Telecon Note: Conversation between Mary Kurserk, NJDEP, and Gerald Hannay, NUS Corporation, October 5, 1989.

23. U.S EPA Contact Laboratory Program, Recra Environmental, Inc., Case No. 10155, Laboratory Analysis from NUS Corporation, Region 2 FIT Site Inspection Conducted on August 2, 1988.

24. U.S. EPA Contact Laboratory Program, JTC Environmental Consultants, Case No. 10155, Laboratory Analysis from NUS Corporation, Region 2 FIT Site Inspection conducted on August 2, 1988.

25. U.S. Federal Register, Vol. 53, No. 122, Friday, June 24, 1988, pages 23791, 23792, and 23793.

26. General Sciences Corporation, Graphical Exposure Modeling System, (GEMS). Landover, Maryland, 1986.

REFERENCE NO. 1

0015-C
02-8805-

NUS CORPORATION TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8805-04	7/22/88	1150

DISTRIBUTION:

Aircraft Painting, Inc.

BETWEEN:	OF:	PHONE:
Tom Iwasz	Aircraft Painting Inc	(609) 825-6792

AND:

Joann Wagner (NUS)

DISCUSSION:

I called for additional information which would help in preparation of the SI work/safety/sampling plan.

The airplanes are washed down with the water/solvent mixture in the tank outside of the hangar. The opening on the tank is on top, about 2 inches in diameter. The hose which they connect to the tank to pump out the diluted solvent is used only for that purpose. The tank does not have to be full for them to pump out the wash waters (i.e., they could pump out the necessary volume into a stainless steel bucket for us to collect a sample).

Aircraft Painting, Inc. occupies the former Boeing-Vertol hangar identified as Building No. 2 on the map from the Millville Eng. Dept.

In addition to the well along Bogden Blvd., there are two wells "at the other end of the airport," he wasn't sure of their exact locations.

I told Tom that we were still planning on doing the SI on

ACTION ITEMS:

8/2/88 as we had mentioned during the recon. He said that would be OK.

Joann Wagner
7/22/88

NUS CORPORATION — TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-5805-04	8/25/88	0855

DISTRIBUTION:

Aircraft Painting, Inc. File

BETWEEN:	OF:	PHONE:
Tom Iwasz	Aircraft Painting, Inc	(609) 825-6792

AND: Joann Wagner (NUS)

DISCUSSION:

Tom Iwasz returned my call of the previous day as per the message I left on his answering machine. The purpose of my call was to obtain information to fill in the data gaps in my draft SI report. Tom Iwasz provided the following information:

- He and his brother have been in operation at the hangar since 1977; no other previous location. They lease the hangar from the city of Millville and assume access to the ramp (i.e., exact size of property is unknown). I asked if he knew the Block and Lot Nos (I wanted to compare it with that on the DEP PA) - all he could tell me is that the number 321B is on the hangar.
- They are on city-supplied water, but not sewage.
- Difference in elevation between top and bottom of ramp - he estimates 4 to 5 feet (my own estimate was about 3 feet) (Slope $= \frac{5}{300} \times 100 = 1.66\%$)
- Solvent wash water storage tank is constructed of steel

~~ACTION ITEMS:~~ ②

- No off-site disposal of materials in storage tank has been necessary yet. In the 4 years or so since they started using it, the recycling and evaporation processes have kept level to its present 1/3 to 1/2-full status.
- Materials stored in room at back of hangar next to office are paints of various colors and shades, and also thinners. Most are 1-gallon cans that are half or less full. No permits are required for the storage of these materials, at least not that he is aware.

NUS 067 REVISED 0581

REFERENCE NO. 2

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

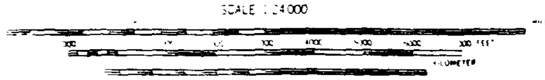
DIVIDING CREEK QUADRANGLE
NEW JERSEY—CUMBERLAND CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

MILLVILLE QUADRANGLE
NEW JERSEY
7.5 MINUTE SERIES (TOPOGRAPHIC)

BRIDGETON QUADRANGLE
NEW JERSEY
7.5 MINUTE SERIES (TOPOGRAPHIC)

CEDARVILLE QUADRANGLE
NEW JERSEY—CUMBERLAND CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

SCALE 1:24000



CONTOUR INTERVAL 10 FEET
DATUM IS MEAN SEA LEVEL

QUADRANGLE LOCATION

There may be private inholdings within the boundaries of the National or State reservations shown on this map

CEDARVILLE, N. J.

N3915—W7507.5/7.5

1956
PHOTOREVISED 197[illegible]
AMS 5962 I SW—SERIES V822

QUADRANGLE LOCATION

BRIDGETON, N.J.

N3922.5—W7507.5/7.5

1953
PHOTOREVISED 1972
AMS 5962 I NW—SERIES V822

QUADRANGLE LOCATION

MILLVILLE, N. J.

N3922.5—W7500/7.5

1953

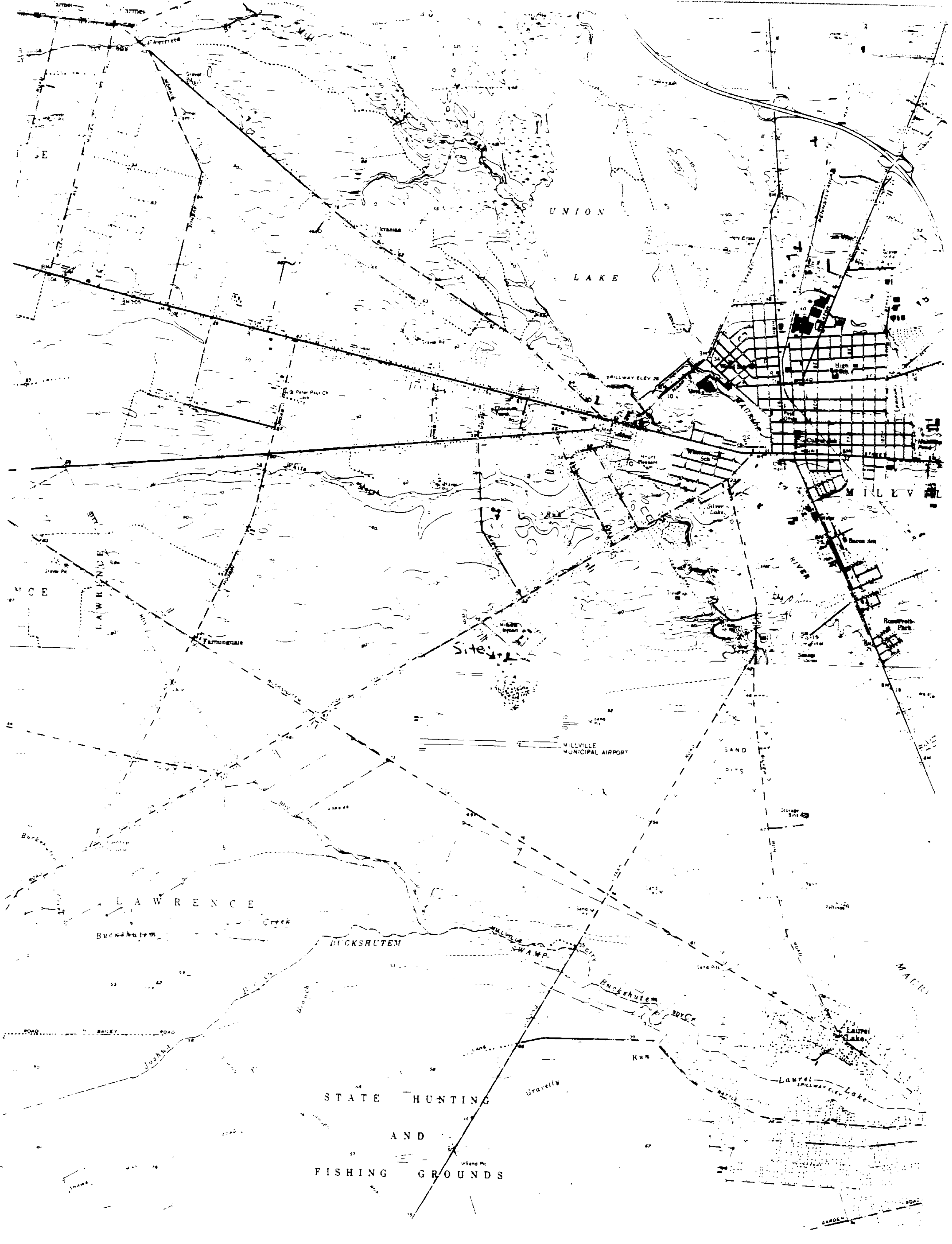
AMS 5962 I NE—SERIES V822

QUADRANGLE LOCATION

DIVIDING CREEK, N. J.

N3915—W7500/7.5

1956
PHOTOREVISED
AMS 5962 I SE—SERIES V822


UNION
LAKE
MILLVILLE MUNICIPAL AIRPORT
SAND
PITS
Site:
Farmingdale
LAWRENCE
L A W R E N C E
Creek
Buckshutem
BUCKSHUTEM
SWAMP
Buckshutem
Silver Lake
RIVER
Roosevelt Park
Laurel Lake
Laurel Lake
Run
Gravelly
STATE HUNTING
AND
FISHING GROUNDS

REFERENCE NO. 3

0013-C 02-8805-04

NUS CORPORATION AND SUBSIDIARIES TELECON NOTE

CONTROL NO: 02-8805-04	DATE: 7/11/88	TIME: 1405

DISTRIBUTION:

Air Craft Painting File

BETWEEN: Tom Iwacz	OF: Air Craft Painting	PHONE: (609) 825-6792

AND: Joann Wagner

DISCUSSION:

Mr. Iwacz called to let me know that he had received the access letter today (7/11/88) - he has no problem with us proceeding with recon as described in the letter. He provided me with the following background information: Air Craft Painting is a small, 2-man operation located in a hangar approximately 165 feet by 65 feet in size. They are in a very visible location. They do not use any respiratory protection, and commonly wear shorts during the warm weather.* Air Craft Painting was cited by the NJDEP about 5 years ago for discharging into a storm drain that emptied into a drainage ditch. Wash waters are now filtered and discharged to a holding tank for recycling. Everyone at the airport used to discharge into the storm drain; the current method of disposal was approved by the DEP.

ACTION ITEMS:

We agreed upon 10 AM on 7/19/88 as the time for the on-site recon; he said the time could be changed if necessary but that the morning would be better for him.

*In addition to the solvent removal of paints from the planes, they also sometimes remove paint by sanding.

NUS 067 REVISED 0685

REFERENCE NO. 4

NUS CORPORATION

II

0284

AIRCRAFT PAINTING
02-8805-04
SITE MANAGER - J. WAGNER
LOGBOOK # 0284
JULY 13, 1988

GUIDANCE FOR PROPER USE OF LOG BOOKS

Purpose

- Serves to document onsite activities and be understandable to an outside reader.
- Provides the basis for later written reports.
- A person not present when field activities were being documented [illegible] each completed page, and countersign and date when satisfied that the written notes are understandable.

Specific Field Activities To Be Documented

Aircraft Holding Inc
Table of Contents

Laura LaTorg
8-9-88

Joanne C. Wagon
8/8/88

0950 Arrived on site. Met Jim & Tom Iwacz
Recon personnel

Joann Wagner	Site Manager
Stanley Shulfer	Site Safety Officer
Kurt Fendler	Surveillance.

1000 Tailgate Safety meeting held - details in Health & Safety field log
OVA L EPA ID No 469783 Field ready 7/14 SB
HNu m EPA ID No. 469749 (11.7 ev probe) Field ready 7/18
Rad meter " " 469786 background 18 cpm

Escape packs.	192094	J. Wagner
	192386	S. Shulfer
	192335	K. Fendler

1005 Proceed to hangar with our monitoring instruments
Floor drain is located along right wall of hangar about 15-20' into hangar. Has been plugged. no readings on OVA. Kurt Fendler reports that HNu is acting up - had been zeroed on 0 and then dropped below. At storm drain, HNu bounced around 4-10 ppm; nothing in breathing zone.

Three drums of solvent along wall from S&B Chemical, Miami. Fla. No readings on OVA or HNu at closed spout on drum. Tom Iwacz shows us a MSDS for solvents. Hazardous ingredients include Dichloromethane (methylene chloride), ammonia, sodium chromate, and methanol. "The ingredient that is a trade secret is excluded from this list."

S. Kruger 8-7-88 Joann L. Wagner 7/19/88

1015 Second floor drain is located about halfway along length of right wall. Again, no readings on the OVA immediately above the drain, but up to 7 ppm on HNu at the drain.

*Note - Floor is very clean - no dust or paint sludge around at all. The sanding method sometimes used utilizes walnut shells.

1020 At rear of hangar - work bench area. No readings on OVA. HNu is hanging around <1 ppm in breathing zone - uncertain if this is due to ambient conditions or defective HNu. Tom Iwasz says that this rear area is where painting is normally done. Back outside the HNu is still at <1 ppm - very windy outside.

1030 Wash waters are collected along right wall of hangar - pump hose takes in collected water from plugged floor drains, pumped into tank outside for reuse. Back inside the hangar again, find gets 10 ppm * on HNu at floor drain, while there is nothing on the OVA. 8 ppm at second drain, 7.5 at hoses on HNu. Office is located at far end of hangar. Solvent storage area next door. By just holding OVA inside solvent storage, 3.5 ppm on OVA, no readings on HNu. In sink room, Stanley got 1.5 ppm. OVA reading at 15-20 ppm behind hangar at first, then went back down.

1040 1P-9, 1S-8 View from rear of hangar towards front, included wall along which floor drains are located and door at far end.

Dawn LaForge 8-9-88

Joanne L. Wagner
7/19/88

Aircraft Painting

1043 1P-10, 15-9 Picture of right wall of hangar floor drain along base of wall, plugged drain in center.

1045 1P-11 15-10
Tank into which wash waters are pumped, located outside of hangar to the right.

1046 1P-12, 15-11
View of front of Aircraft Painting Inc.
12 cpm on mini-rad.

1047 1P-13, 15-12
View of storm drain in front of hangar 300 ft.

1050 Proceed to drainage ditch in suburban following Jim Iwasz in his pick-up truck

Drainage ditch is located behind airport restaurant down a 10 foot embankment, extends for about 3000 feet back according to Jim Iwasz. To ~~set up~~ do Level B recon here would require setting up decon area beyond and on Restaurant property. We will try to find another access point.

1110 Returned to Aircraft Painting. Will call the office to speak with RHSM about downgrading recon of drainage ditch because of its proximity to restaurant. Lynn Budd OK's use of just dermal protection for recon during phone call at 1125

1130 Zina Chiola - mgr of Airport Rest. & Lounge gave us permission to set up decon area behind the restaurant.

Laura LaForge 8-9-88

Joanne L Wagner 7/12/88

7/19/88

02-8805-54

Aircraft Painting

1145 Decon area set up behind restaurant.
Kurt & Stanley will go down to drainage ditch.
I will stay at top of bank to maintain line-of-sight.

1140 Ecum personnel proceed to drainage ditch

1143 1P-14, 15-13 Picture of Kurt & Stanley doing
recon of upstream-most portion of drainage ditch.
There were no readings on the OVA or HNU before
or after throwing a rock into the water in the ditch.

1149 1P-15, 15-14 View of upstream-most portion of
drainage ditch

1150 Return to decon area. No readings were recorded
on the OVA or HNU while at the drainage ditch.
Will cleanup and leave site.

1200 Went to lunch. Airport Restaurant & Lounge contacts. Manager -
Rich Panczyszyn (609) 327-2284
Zina Cilicia, Asst Manager - Rich Panczyszyn (609) 327-2284
1310 Stopped by Airport Administration Bldg to find out
if they have a map showing the drainage system of the
airport. We were told to check at City Hall Eng. Dept.

1320 Arrived at Millville City Hall. Will check at Engineering
Dept for map of drainage system and at water dept. for
well location information, records, and analyses.

1400 Returned to vehicle. The Millville Eng. Dept. will send
us maps of the drainage system and well locations
(there are 3 wells on the airport property). The super-
intendent of the Eng. Dept (Bill McCafferty) will have

Joan L Wager
7/19/88

Laura LaSorga 8-9-88

his assistant, Adolf Turasevich, get the information out to us. The water dept (billing) on the first floor of City Hall referred us back to the engineering dept. for well records and analyses. Mr. McCafferty said he would send them to us also. I left one of my business cards with him. He suggested that we stop by the Water Utility bldg behind City Hall for additional info. Jack Harris, the superintendent, was not there at the time nor could his secretary locate him. She provided us with copies of well logs for airport wells No. 1, 2, & 3. Their copies were not of good quality, so ours are even worse. Layne-New York Co., Inc., who provided the water utility with the logs is now known as Hydro-Group, phone number (609) 235-3700. Their contact at Hydro Group is John Thaeder. Neither the Water Dept nor the Eng. Dept were able to provide us with well water analyses.

1415 Called office (Ben Hessemer) to report on our status and that we were on our way back.

Joan L. Wagner
7/19/88

Laura LaForge 8-9-88

Aircraft Painting Inc

0740 Arrive at restaurant behind which we will be collecting surface water and sediment samples. NUS personnel

Joann Wagner - Site Manager
Stan Shuler - Site Safety Officer
Chris Casiere - Sample Management Officer
Phil Sulaski - Sampler
Kurt Fendler - Sampler
Darrel Soultod - Sampler

The following air monitoring instruments will be used.
OVA G EPA ID No. 428821
HNu J EPA ID No. 4097415
Explosimeter D EPA ID No. 307151 (for tank sampling only)
Rad meter EPA ID No. 428520 (mini-alert)
* An 11.7 ev probe was not available for use. A 10.2 ev probe HNu will be used instead. The drainage ditch was recorded two weeks ago with the 11.7 ev probe - no readings were obtained before or after disturbance of the drainage ditch.

0758 Elmer Bird, Zone Health & Safety manager, arrives on site. Darrel gives him copy of Site Safety Plan.

0805 Tailgate safety meeting held. Details in Health & Safety Field Log.

Weather - warm, humid, 80°F, light winds from the southwest, sunny

Laura LaForge 8-9-88 Joann L. Wagner 8/2/88

8/2 '88

NJ-83-5 C4

Airwash Painting, Inc.

0820 Personnel deconning equipment (trowel & bowl) prior to sample collection

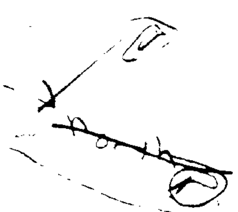
drainage ditch

0850 Arrive at SW1 location. Begin collection of VOAs
0855 Stanley reports readings of 0.4 to 0.6 ppm at surface of water, nothing in breathing zone. Background on mini-rad is 18 cpm

1D-1, 1S-1
0905 Kurt Fendler collecting NJ88-SW1
0910 No readings above background. SW1 location is ~ 8 feet past concrete embankment of drainage ditch
0915 OVA pegged on seal sample in bottle
HNu was 7 ppm in bottle
both instruments dropped down in breathing zone.
Strong organic odor reported, also petroleum smell
will have to go back to command post to get SCBAs

0920 Return to command post to suit up on Level B
SCBA numbers:

629757 Kurt Fendler
192083 Stan Shulfer (back up)
307175 Phil Solinski



~~1055~~ 0955 Return to SED 1 Location
1005 Kurt & Phil on air
8.5 ppm on OVA } in bowl with sediment
7 ppm on HNu } sample

R — north in this

1010 1D-2, 1S-2, Kurt Fendler collecting NJ88-SED1
Stan reports 5 ppm on OVA in breathing zone
J. Wagner & Stan back off
1014 Kurt & Phil off air

M. L. Wagner 8/2/88

Laurie Lafage 8-9-88

Joan L. Wagner 8/2/88

Aircraft Painting, Inc.

SW1 [illegible]

1020 Sampling crew drops off SED & sample bottles at command post, proceeds to upstream sample location. Phil reports that there was an oil sheen in the surface water at SW1 location (downstream).

1030 Difficulty encountered in trying to get to sample location with air monitoring instruments ~~&~~ while also wearing SCBA tanks. Will take a break, remove tanks, return to sample location in a few minutes

Darrel & Elmer Bird have been maintaining line of sight at top of drainage ditch bank at downstream sample location, while Chris Losiere has been stationed within view of command post at upstream sample location.

1040 Kurt & Phil decoming NJ88-SED1 sample bottles

1055 Sampling crew returns to upstream sample location

1100 Kurt and Phil begin collecting NJ88-SW2 & SW3 VOAs (SW3 is envir. dup. of SW2)

No readings above background have been observed on the ~~OVA~~ or HNu

~~1110~~ 1115 Phil Solinski collecting NJ88 SW-2 [illegible], [illegible]

Stan reports readings at 2.2 ppm and rising in the breathing zone. Samplers return to command post to suit up on Level B.

1120 Joan Wagner goes in to restaurant to call water dept. to make arrangements to meet Danny McLoughlin at 1200 instead of 1130

Laura LaPage 8-9-88 Joann L. Wagner 8/2/88

J. Wagner 8/2/88

Aircraft Painting Inc

1130 Crew returns to upstream sample location on Level B, Stan in Level B back-up
Phil S. & Kurt Fedler on air at 1138

1135 12-4, 15-4 Phil S. collecting NJ88-SW3. SW-2, SW-3, SED-2, SED-3 sample locations, 10 feet below storm drain outfall

1138 12-5, 15-5 Kurt Fedler collecting NJ88-SED2
Phil Solinski reports that sediment is very gravelly, with specks of paint chips

1140 Kurt Fedler collecting NJ88-SED3

1142 Kurt's SCBA bell begins ringing. He comes up out of drainage ditch to command post. Phil Solinski finishes collecting sample. He and Stan return to command post also.

1144 Kurt off air.

1145 Phil off air.

Sample bottles will be placed in trash bags and bailed up with everything else to be decontaminated at Aircraft Painting Inc. site

1210 Everything has been ~~bag~~ bagged and/or packed up. Kurt and Phil will follow Stan and Elmer to Aircraft Painting to let Tom & Jim Iwase know we will be there shortly. Chris, Darrell, and I will follow Danny ~~McClo~~ McLaughlin to well locations

1220 Chris, Darrel, J. Wagner arrive at GW2 well house location (Airport well no. 3)

James L. Wagner
8/9/88

Laura LaYorga 8-9-88

1222 Danny McLaughlin turns on tap at well, he says it has been running for more than 15 minutes

1225 1D-7,8 1S-7,8
Chris Casiere collecting NJ88-GW2 / downgradient (Duplicate GW) from well house located behind restaurant Polynesian

1230 Finish collecting NJ88-GW2, will proceed to NJ88 GW1 which is the upgradient sample on the other end of the airport

1232 Arrive at upgradient well location Airport Well #1 in well house near (east of) runway, south of Aircraft Painting
1235 1D-8, 1S-9,10
Darrell Boothe collecting NJ88-GW1

1245 Return to Aircraft Painting Inc. Have debriefing meeting with Elmer Burd. at rear of Aircraft Painting hangar

1300 Elmer Burd leaves site.

1305 Stan, Darell, and I walk to front of hangar to check out hose attachment to tank and storm drain. Storm drain is almost dry - puddles here and there, ~~note~~ but there is not enough to fully cover the bottom of the drain. The pavement is stained from the hangar to the storm drain, sort of gray-green color

1310 Stan, Darell, ~~and~~ I return to rear of hangar to await return of Tom & Jim to site from lunch

1325 Stan, Darell and I go to Red Baron Restaurant to call the office about tank and hose set up. Bob Scutt was not in, Stan talked to Don Hessener. He did not like the idea of us using their pumps and hoses

Laura LaForge 8-9-88

Joan L. Wagner 8/3/88

Accurate Painting Inc.

1345 We return to hangar. Tom & Jim Evans have returned from lunch. We begin to set up decon area in front of the hangar and upwind of the tank.

1400 Tom explains the pumping set up to me - large green hose ran from tank to pump, small black hose from pump to tank for mixing. The small black hose had a nozzle on it we could have collected sample from. However, since this is not an EPA approved method of collection in terms of sampling equipment, we will have to use our own set-up. The tank is 1/3 to 1/2 full. It holds approx. 4000 gallons. It is sitting on a slight slope, so that the bottom end is "fuller" than the upper end. The tank is located about 50 feet south and outside of the hangar.

1413 Weather - sunny, hot, 95°F in the shade, wind 5-10 mph from west. Sampling personnel (Kurt & Phil) and I decon previously used equipment and sample bottles. Chris & Darell will handle SMD

~~1440~~ 1445 Kurt & Phil begin collecting Rinsate 2 on the Erlenmeyer flask

1457 Correction to the above entry - Phil is collecting Rinsate 2 from the flask; Kurt is collecting Rinsate 1 from the trowel/bowl

1510 Same air monitoring instruments will be used here as at restaurant sampling locations. The same SCBAs will also be used by the same people as last time, using fresh tanks. The explosimeter will also be used. The OVA was originally set at 1ppm it rose to 3ppm sitting on cooler in decon area and has been holding steady.

Joan L. Wegan 8/2/88

Laura LeGray 8-8-88

03-3525 [illegible]

[illegible] Painting Inc.

1530 Kurt & Phil and Stan began dressing up in Level B for tank sampling. Kurt and Phil will be wearing ~~[illegible]~~ SCBA's, Stan will be in Level B backup

1540 3 ~~ppm~~ on HNu at opening of tank 20 ppm on OVA. OVA is dropped off back at command post because of low H_2 supply

1542 Kurt & Phil on air to ~~[illegible]~~ begin sampling tank. Nothing coming through - either sucking up air or stuck in sludge

1550 Begin getting sample from upper end of tank - seemed only to be getting sludge or air at lower end of tank. Stan retrieves OVA from command post.

1555 No readings in breathing zone on OVA, but 75 ppm in flask. Nothing on HNu in breathing zone or flask. Explosimeter reading 1.5 in flask

17-9, 15-11

1600 Kurt Fendler collecting tank sample

1615 Still collecting samples. Tom Irwest explains that the tank was originally black so that the liquid would evaporate off, within the last year the City of Millville decided that they didn't like the black tank, so they painted it ~~[illegible]~~ white.

1620 Kurt Fendler needs a break, leaves sampling to Phil & goes off air

1622 Phil's SCBA bell goes off. He leaves sampling area to go off air and change tanks.

1650 Jo Wagner calls the office to request permission to stay overnight again in Millville ~~[illegible]~~ because of the exhaustion of the sampling crew. Don H. gives us the OK to do so. Roberta Riccio says we can drop off samples tomorrow if necessary.

[signature] 8-9-88 [signature] 8/3/88

Aircraft Painting Inc

1700 Kurt + Phil both taking a break

1710 Kurt and Phil back on air to fill [illegible] sample bottles

1715 Finished collecting samples. Samplers will decon sample bottles on Level 3.

Kurt off air at 1725, Phil off air at 1730

1730 J Wagner calls hotel to reserve rooms while samples are decon'ed, sealed and packed in coolers

1825 1P-10, 1S-12 View of discolored pavement between hangar and storm drain

1P-11, 1S-13 View along storm drain facing east at Airworks Corp.

1830 Leave site. Samples will be dropped off at Federal Express on 8/3/88. The nearest Fed Ex office closes at 1930, and stopped pick-up at 1700. The storm drain sample was not collected, as there was insufficient water in the drain to collect a sample.

Joanne L. Wagner
8/2/88

Laura LeYoya 8-9-88

0830 Met for breakfast

0900 Went to Millville City Hall to get maps of the airport from the engineering department showing airport layout, storm drains, well locations, etc.

0950 Left Millville.

1100 Arrived at Federal Express in Mount Laurel to drop off samples from yesterday. Will go to Exxon station up the road before returning to turnpike to go back to office.

1135 Left Exxon station

Karen Lefoy 8-9-88

Joanne L. Wagner 8/3/88

8/4/88

Aircraft Painting, Inc.
Millville, NJ
Sample Dispatch Information
Sampling Date: 8/2/88
Case No. 10079

HUS Sample Number	CLP NUMBERS ORGANIC	INORGANIC	Sample Matrix	Page No.
NJ88-TA1	BT 411	MBQ 700	Aqueous tank sample (medium concentration)	15
NJ88-SED1	BT 412	MBQ 701	Sediment (MS/MSD)	10
NJ88-SED2	BT 413	MBQ 702	Sediment	12
NJ88-SED3	BT 414	MBQ 703	Sediment (env. dup. of NJ88-SED2)	12
NJ88-SW1	BT 415	MBQ 704	Surface Water (MS/MSD)	10
NJ88-SW2	BT 416	MBQ 705	Surface Water	11
NJ88-SW3	BT 417	MBQ 706	Surface Water (env. dup of NJ88-SW2)	12
NJ88-GW1	BT 418	MBQ 707	Groundwater (tap sample)	13
NJ88-GW2	BT 419	MBQ 708	Groundwater (tap sample)	12-13
NJ88-RIN1	BT 421	MBQ 710	Trowel/bowl aqueous rinsate	14
NJ88-RIN2	BT 422	MBQ 711	Flask aqueous rinsate	14
NJ88-TBLK1	BT 423	~~MBQ 712~~	Aqueous trip blank	N/A

Samples for organics analysis were shipped to Recra Environmental Inc. via Federal Express under Airbill Nos. 9276042613 (low conc.) and 6004136466 (medium conc.) at 1100 hours on August 3, 1988.

Samples for inorganics analysis were shipped to JTC Environmental Consultants via Federal Express under Airbill Nos. 9276042834 (low conc.) and 6004136454 (medium conc.) at 1100 hours on August 3, 1988.

[signature] 8-9-88

[signature] 8/4/88

Millville, NJ
Sampling Date 8/2/88
Case No. 1CC79

SAMPLE BOTTLE LOT NUMBERS

	VOA	32 OZ	16 OZ
TA1	I-CHEM B8132413	I-CHEM J8105073	EAGLE PICHER E8064094
	VOA	8 OZ	
SED1	I-CHEM D8200583	I-CHEM F8028303	
SED2	I-CHEM D8200583	I-CHEM F8028303	
SED3	I-CHEM D8200583	I-CHEM F8028303	
	VOA	80 OZ	POLY
TBLK1	I-CHEM B8132413	-----	-----
RIN1	I-CHEM B8132413	I-CHEM A8188113	EAGLE PICHER C8134273
RIN2	I-CHEM B8132413	I-CHEM A8188113	EAGLE PICHER C8134273
GW1	I-CHEM B8132413	I-CHEM A8188113	EAGLE PICHER C8134273
GW2	I-CHEM B8034823	I-CHEM A8188113	EAGLE PICHER C8134273
SW1	I-CHEM B8034823	I-CHEM A8188113	EAGLE PICHER C8134273
SW2	I-CHEM B8034823	I-CHEM A8188113	EAGLE PICHER C8134273
SW3	I-CHEM B8034823	I-CHEM A8188113	EAGLE PICHER C8134273

Millville, NJ
Sampling Date 8/3/88
Case No 10079

02-8805-04

BLANK WATER LOT NUMBERS

VOA	I-CHEM	B8132413
AMBER	I-CHEM	A8188113
POLY	EAGLE PICHER	C9112020

Laura LaForge
8-9-88

Joe [illegible]
8/11/88

..-8803 04 8/9/88

Aircraft Painting, Inc.

Photograph Log

On-site Reconnaissance July 19, 1988

Photographer Joann Wagner

Roll No.	Frame No.	Time	Photo Description
1P	9	1040	View from rear of Aircraft Painting, Inc. hangar towards the front, showing the wall along which the floor drains are located.
1S	8	1040	
1P	10	1043	East wall of hangar along which floor drains are located. This shows the location of one of the plugged drains (within darkened area to the right of the top of the step ladder) approx. 15 to 20 feet from the hangar door.
1S	9	1043	
1P	12 ~~11~~	1046	View of the front of the Aircraft Painting, Inc. hangar, facing north.
1S	11 ~~10~~	1046	
1P	11	1045	Storage tank into which solvent wash waters are pumped. The tank is located along the east side of the site, in front of the hangar. (50 yd.)
1S	10	1045	
1P	13	1047	Storm drain 300 feet south of hangar into which floor drains used to flow.
1S	12	1047	

Joann L. Wagner 8/9/88 Laura [illegible] 8-9-88

- -3505-04 8/9/88

Aircraft Painting, Inc.
Photograph Log (cont'd)
On-site Reconnaissance July 19, 1988
Photographer: Joann Wagner

Roll No.	Frame No.	Time	Photo Description
1P 1S	14 13	1143 1143	Stan Shulfer and Curt Fendler ~~collecting~~ conducting recon of storm drain outfall at drainage ditch behind the Airport Restaurant and Lounge.
1P 1S	15 14	1149 1149	Upstream-most portion of the drainage ditch behind the Airport Restaurant and Lounge. The storm drain is just barely visible at the left center of the photo.

8/9/88

Laura LaForge
8-9-88

Joann L. Wagner
8/9/88

Aircraft Painting, Inc.
Photograph Log
Site Inspection August 9, 1988
Photographer Joann Wagner

Roll No.	Frame No.	Time	Sample No.	Photo Description
1P	1	0905	NJ88SW1 }(ms/msd)	Kurt Fendler collecting surface water sample from drainage ditch behind the Airport Restaurant and Lounge; sample location is approx. 8 feet downstream from the end of a concrete embankment on the ditch.
1S	1	0905	NJ88-SW1	
1P	2	1010	NJ88-SED1 }(ms/msd)	Kurt Fendler collecting sediment sample from same location as NJ88-SW1.
1S	2	1010	NJ88-SED1	
1P	3	1110	NJ88-SW2	Phil Solinski collecting surface water sample from drainage ditch behind Airport Restaurant and Lounge; sample location is approx. 10 feet downstream of storm drain outfall.
1S	3	1110	NJ88-SW2	
1P	4	1135	NJ88-SW3	Phil Solinski collecting env. dup. sample from same location as NJ88-SW2.
1S	4	1135	NJ88-SW3 (env. dup. of SW2)	

Laura LaPage 8-9-88 Joann Wagner 8/9/88

Aircraft Painting, Inc.
Photograph Log (cont'd)
Site Inspection August 2, 1988
Photographer: Joann Wagner

Roll No.	Frame No.	Time	Sample No.	Photo Description
1P	5	1138	NJ88-SED2	Kurt Fendler collecting
1S	5	1138	NJ88-SED2	Sediment sample from same location as NJ88-SW2.
1P	6	1140	NJ88-SED3	Kurt Fendler collecting
1S	6	1140	NJ88-SED3 (env. dup. of SED2)	env. dup. sample from same location as NJ88-SED2 (10 feet below storm drain outfall).
1P	7	1225	NJ88-GW2	Chris Casiere collecting
1S	7,8	1225	NJ88-GW2	downgradient groundwater (tap) sample from well house of ~~[illegible]~~ Airport Well No. 3, located northeast of Airport Restaurant and Lounge parking lot.
1P	8	1235	NJ88-GW1	Darrell Soo Hoo
1S	9,10	1235	NJ88-GW1	collecting upgradient groundwater (tap) sample from Airport Well No. 1 well house.

Karin LaForge
7-9-88

Joann L Wagner
8/9/88

Aircraft Painting, Inc
Photograph Log (cont'd)
Site Inspection August 2, 1988
Photographer: Joann Wagner

Roll No.	Frame No.	Time	Sample No.	Photo Description
LP	9	1600	NJ88-TA1	Kurt Fendler collecting sample from tank into Erlenmeyer flask via a hand-operated vacuum pump and Teflon-lined polypropylene tubing.
1S	11	1600	NJ88-TA1	
1P	10	1825	N/A	View of discolored/stained pavement between Aircraft Painting, Inc hangar and storm drain located 300 feet south of it. Photo was taken while standing at this storm drain and facing north.
1S	12	1825	N/A	
LP	11	1825	N/A	View along storm drain located 300 feet south (and downslope) of Aircraft Painting, Inc. hangar, facing east toward adjacent Airwork Corp. facility. The storm drain extends across that property also.
1S	13	1825	N/A	

[illegible] 8-9-88   Joann L. Wagner 8/9/88

REFERENCE NO. 5

NJD096854229

PRELIMINARY ASSESSMENT REVIEW FORM

SITE NAME: Air Craft Painting Inc
ALIASES:
ADDRESS: Millville Municipal Air Port
CITY: Millville
COUNTY: Cumberland Co
STATE: NJ
PRIORITY RATING GIVEN: low
(BY STATE OR CONTRACTOR)

COMPLETED

AGREE:
DISAGREE: ✓
(CHECK ONE)

IF DISAGREE, WHY?

Site inspection done in 1982. Prior to that wastewater containing methylene-chloride washed into storm sewer. Possible groundwater contamination

OTHER COMMENTS:

Ditch that previously received discharge from storm sewer to which facility discharged may contain residual contamination.

PA does not indicate how long this process had been discharging to ditch from storm sewer.

RECOMMENDATION: Medium
FINAL (BY EPA)

REVIEWER: Karen Sudy
DATE: 2/14/85

Concur w/ Reviewer's recommendation.
Determine current status of state actions, if any.
Conduct SI
Perry Katz 3/3/85

Preliminary Assessment

Air Craft Painting Inc.
Millville Municipal Air Port
Millville/Cumberland County
New Jersey

Air Craft Painting Inc.
Millville Municipal Air Port
Millville/Cumberland County
New Jersey

Air Craft Painting Inc. is involved in the cleaning and painting of small aircraft.

Mr. James Iwasz, co-owner of Air Craft Painting Inc. stated that 3 or 4 aircraft are painted per month. The process involves spray application of solvent onto the aircraft body. This causes the paint to coagulate and the paint eventually drips off onto the floor. The practice at Air Craft Painting Inc. prior to any D.E.P. investigation was to scrap up all the paint off the floor and place it in drums and dispose of the paint into a garbage dumpster. The floor was then washed down with water which goes to a drain along the wall and eventually flows into the storm sewer.

The practice at Air Craft Painting Inc. now is to store the paint sludges and wash water in 55-gallon drums inside the building. Swanson's Hauling and Trash Removal of 2 Edgehill Ave., Millville (327-1052) removes the waste to the Millville Landfill.

Due to all the steps taken to prevent any further danger to the environment, a low priority is given to this site.

Submitted by: Fred Schmitt
Project Manager
NJDEP-HSMA
CERCLA 104 Project

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 1 - SITE INFORMATION AND ASSESSMENT

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER

II. SITE NAME AND LOCATION

01 SITE NAME	02 STREET, ROUTE NO., OR SPECIFIC LOCATION IDENTIFIER
Air Craft Painting Inc.	Millville Municipal Air Port

03 CITY	04 STATE	05 ZIP CODE	06 COUNTY	07 COUNTY CODE	08 CONG DIST
Millville	NJ	08332	Cumberland		

09 COORDINATES LATITUDE	LONGITUDE	
39°31'54"	75°31'24"	Block 631 Lot 23

10 DIRECTIONS TO SITE: Rte 47 South to High St.Millville take Rte 59 West to Cedarville Rd.Take left hand turn to Bogden Blvd.into Air Port. R/H turn onto Beacon Ave.to dead end.Site on right.

III. RESPONSIBLE PARTIES

01 OWNER	02 STREET
City of Millville	

03 CITY	04 STATE	05 ZIP CODE	06 TELEPHONE NUMBER
Millville P.O. Box 609	NJ	08332	(609)825-7000

07 OPERATOR	08 STREET

09 CITY	10 STATE	11 ZIP CODE	12 TELEPHONE NUMBER
			( )

13 TYPE OF OWNERSHIP (Check one)
☐ A. PRIVATE ☐ B. FEDERAL: ________ (Agency name) ☐ C. STATE ☐ D. COUNTY ☒ E. MUNICIPAL
☐ F. OTHER: ________ (Specify) ☐ G. UNKNOWN

14 OWNER/OPERATOR NOTIFICATION ON FILE (Check all that apply)
☐ A. RCRA 3001 DATE RECEIVED __/__/__ (MONTH DAY YEAR) ☐ B. UNCONTROLLED WASTE SITE (CERCLA 103 c) DATE RECEIVED __/__/__ (MONTH DAY YEAR) ☐ C. NONE

IV. CHARACTERIZATION OF POTENTIAL HAZARD

01 ON SITE INSPECTION
☒ YES DATE 6/29/82 (MONTH DAY YEAR)
☐ NO

BY (Check all that apply)
☐ A. EPA ☐ B. EPA CONTRACTOR ☒ C. STATE ☐ D. OTHER CONTRACTOR
☐ E. LOCAL HEALTH OFFICIAL ☐ F. OTHER: ________ (Specify)
CONTRACTOR NAME(S): ________

02 SITE STATUS (Check one)
☒ A. ACTIVE ☐ B. INACTIVE ☐ C. UNKNOWN

03 YEARS OF OPERATION
____ BEGINNING YEAR | ____ ENDING YEAR ☐ UNKNOWN

04 DESCRIPTION OF SUBSTANCES POSSIBLY PRESENT, KNOWN, OR ALLEGED
Solvent containing 58% methylene chloride stripping

05 DESCRIPTION OF POTENTIAL HAZARD TO ENVIRONMENT AND/OR POPULATION
Wastewater containing methylene-chloride was washed off the floor and into the storm sewer.May contaminate storm sewer basin and groundwater.

V. PRIORITY ASSESSMENT

01 PRIORITY FOR INSPECTION (Check one. If high or medium is checked, complete Part 2 - Waste Information and Part 3 - Description of Hazardous Conditions and Incidents)
☐ A. HIGH (Inspection required promptly) ☐ B. MEDIUM (Inspection required) ☒ C. LOW (Inspect on time available basis) ☐ D. NONE (No further action needed, complete current disposition form)

VI. INFORMATION AVAILABLE FROM

01 CONTACT	02 OF (Agency/Organization)		03 TELEPHONE NUMBER
Jee Douglass	NJDEP/DWR		609292-1871

04 PERSON RESPONSIBLE FOR ASSESSMENT	05 AGENCY	06 ORGANIZATION	07 TELEPHONE NUMBER	08 DATE
Fred Schmitt	NJDEP	HSMA-BEERA	(609)292-1215	1/2/85

EPA

POTENTIAL HAZARDOUS WASTE SITE PRELIMINARY ASSESSMENT
PART 2 - WASTE INFORMATION

I. IDENTIFICATION

01 STATE	02 SITE NUMBER

II. WASTE STATES, QUANTITIES, AND CHARACTERISTICS

01 PHYSICAL STATES (Check all that apply)

- [ ] A. SOLID
- [ ] B. POWDER, FINES
- [ ] C. SLUDGE
- [ ] D. OTHER ______ (Specify)
- [ ] E. SLURRY
- [x] F. LIQUID
- [ ] G. GAS

02 WASTE QUANTITY AT SITE (Measures of waste quantities must be independent)

TONS ______

CUBIC YARDS ______

NO. OF DRUMS 5

03 WASTE CHARACTERISTICS (Check all that apply)

- [ ] A. TOXIC
- [ ] B. CORROSIVE
- [ ] C. RADIOACTIVE
- [ ] D. PERSISTENT
- [ ] E. SOLUBLE
- [ ] F. INFECTIOUS
- [ ] G. FLAMMABLE
- [ ] H. IGNITABLE
- [ ] I. HIGHLY VOLATILE
- [ ] J. EXPLOSIVE
- [ ] K. REACTIVE
- [ ] L. INCOMPATIBLE
- [ ] M. NOT APPLICABLE

III. WASTE TYPE

CATEGORY	SUBSTANCE NAME	01 GROSS AMOUNT	02 UNIT OF MEASURE	03 COMMENTS
SLU	SLUDGE			
OLW	OILY WASTE			
SOL	SOLVENTS	5	Gals	Wastewater w/methylene chloride
PSD	PESTICIDES			
OCC	OTHER ORGANIC CHEMICALS			
IOC	INORGANIC CHEMICALS			
ACD	ACIDS			
BAS	BASES			Attachment A
MES	HEAVY METALS			

IV. HAZARDOUS SUBSTANCES (See Appendix for most frequently cited CAS Numbers)

01 CATEGORY	02 SUBSTANCE NAME	03 CAS NUMBER	04 STORAGE/DISPOSAL METHOD	05 CONCENTRATION	06 MEASURE OF CONCENTRATION
SOL	Methylene chloride		Drum	58	% by wt
			(Stripping solvent)		

V. FEEDSTOCKS (See Appendix for CAS Numbers)

CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER	CATEGORY	01 FEEDSTOCK NAME	02 CAS NUMBER
FDS			FDS		
FDS			FDS		
FDS			FDS		
FDS			FDS		

VI. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Hazardous Waste Investigation 6/29/82   Attachment A

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION
01 STATE | 02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS

01 [X] A. GROUNDWATER CONTAMINATION — 02 [ ] OBSERVED (DATE: ______) [ ] POTENTIAL [X] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Millville Municipal Well #3 contaminated - Joseph Douglass memo 5/20/82

Attachment B

01 [X] B. SURFACE WATER CONTAMINATION — 02 [ ] OBSERVED (DATE: ______) [X] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Receiving water basin's wastewater flow to storm sewer drains.

01 [ ] C. CONTAMINATION OF AIR — 02 [ ] OBSERVED (DATE: ______) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 [ ] D. FIRE/EXPLOSIVE CONDITIONS — 02 [ ] OBSERVED (DATE: ______) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 [ ] E. [illegible] — 02 [ ] OBSERVED (DATE: ______) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 [X] F. CONTAMINATION OF SOIL — 02 [ ] OBSERVED (DATE: ______) [X] POTENTIAL [ ] ALLEGED
03 AREA POTENTIALLY AFFECTED: ______ (Acres) 04 NARRATIVE DESCRIPTION

Wastewater out of building thru floor drains may reach ground surface.

01 [X] G. DRINKING WATER CONTAMINATION — 02 [ ] OBSERVED (DATE: ______) [X] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

Groundwater may be contaminated.Millville Municipal Well #3 is allegedly contaminated.(No analysis)

01 [ ] H. WORKER EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE: ______) [ ] POTENTIAL [ ] ALLEGED
03 WORKERS POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

01 [ ] I. POPULATION EXPOSURE/INJURY — 02 [ ] OBSERVED (DATE: ______) [ ] POTENTIAL [ ] ALLEGED
03 POPULATION POTENTIALLY AFFECTED: ______ 04 NARRATIVE DESCRIPTION

EPA

POTENTIAL HAZARDOUS WASTE SITE
PRELIMINARY ASSESSMENT
PART 3 - DESCRIPTION OF HAZARDOUS CONDITIONS AND INCIDENTS

I. IDENTIFICATION	
01 STATE	02 SITE NUMBER

II. HAZARDOUS CONDITIONS AND INCIDENTS (Continued)

01 ☐ J. DAMAGE TO FLORA — 02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ K. DAMAGE TO FAUNA — 02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION (Include name(s) of species)

01 ☐ L. CONTAMINATION OF FOOD CHAIN — 02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☒ M. UNSTABLE CONTAINMENT OF WASTES (Spills/runoff/standing liquids/leaking drums) — 02 ☒ OBSERVED (DATE: 6/29/82) ☐ POTENTIAL ☐ ALLEGED — Attachment A
03 POPULATION POTENTIALLY AFFECTED: ________ 04 NARRATIVE DESCRIPTION

The floor is washed down with water after paint sludges are picked up & goes to a drain along the wall and eventually flows into the storm sewer.

01 ☐ N. DAMAGE TO OFFSITE PROPERTY — 02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ O. CONTAMINATION OF SEWERS, STORM DRAINS, WWTPs — 02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

01 ☐ P. ILLEGAL/UNAUTHORIZED DUMPING — 02 ☐ OBSERVED (DATE: ________) ☐ POTENTIAL ☐ ALLEGED
04 NARRATIVE DESCRIPTION

05 DESCRIPTION OF ANY OTHER KNOWN, POTENTIAL, OR ALLEGED HAZARDS

III. TOTAL POPULATION POTENTIALLY AFFECTED: ________

IV. COMMENTS

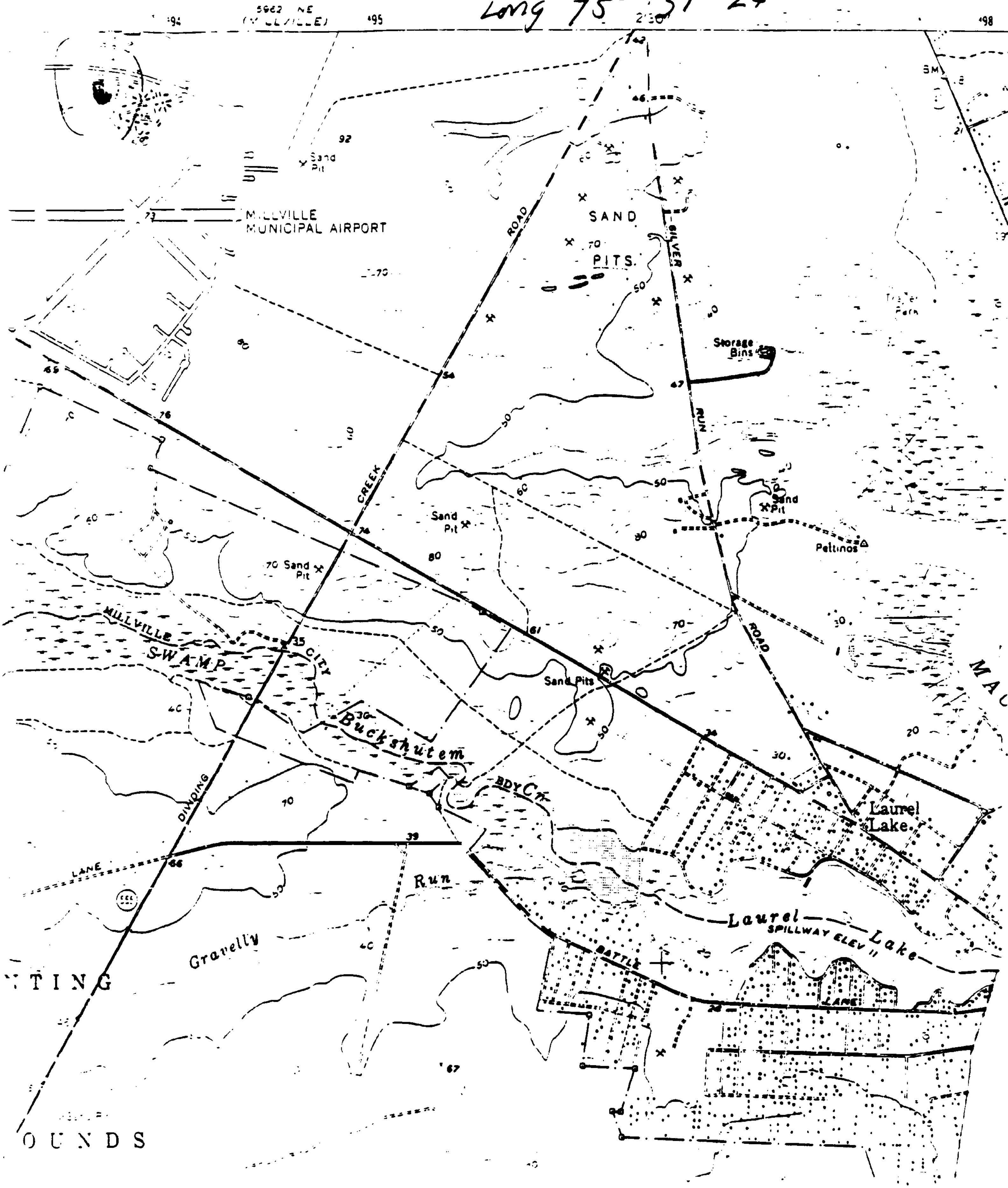
V. SOURCES OF INFORMATION (Cite specific references, e.g., state files, sample analysis, reports)

Hazardous Waste Investigation form dated 6/29/82 - William Lowry
Attachment A

EPA FORM 2070-12 (7-81)

Air Craft Parming, Cumberland Co

LAT. 39° 31' 54"
Long 75° 31' 24"



HAZARDOUS WASTE INVESTIGATION HW/EF 06-17

Inspector: William Lowry Date: 6/29/82

Location: Aircraft Painting Inc.

St: Millville Municipal Airport Property owner: City of Millville

Town: Millville

County: Cumberland

Lot: 23 Block: 631

Origin of Complaint: Joseph Douglas, DWR (2-1871).

Complaint: Company is disposing of paint sludges into trash dumpster.

Findings:

On the above date, this inspector met with Mr. Jim Iwasz, co-owner of Aircraft Painting Inc. Mr. Iwasz explained that his company is involved with stripping and repainting airplanes.

<u>Process</u>

Mr. Iwasz stated that 3 or 4 planes per month are repainted. The process involves spray application of solvent onto the airplane body. This causes the paint to coagulate and the paint eventually drips off onto the floor. These paint sludges prior to initial DEP investigations, had been scraped up and placed into a drum and disposed of into the garbage dumpster. The floor is then washed down with water which goes to a drain along the wall and eventually flows into the storm sewer.

Since the initial investigation by J. Douglass, DWR, Aircraft Painting is now storing the paint sludges and wash water in 55 gallon drums inside the building. The stripping solvent used is 58% methalene chloride base manufactured by B & B Chemical Co. Inc. Miami, Fla.

At time of this inspection, five, 55 gallon drums of wash water have been accumulated. The paint sludges are also placed into a drum. Approximately ½ drum of paint sludges are currently stored on site. Mr. Iwasz estimates that one, 55 gallon drum of paint sludges will be generated every six months.

<u>Waste Streams</u>

Mr. Iwasz indicated that his trash is taken to the Milleville Landfill by Swanson's Hauling and Trash Removal, 2 Edgehill Ave., Millville (327-1052).

A seal has been placed on the manhole to the storm sewer per the DWR order and a sump pump is currently being used to pump the wash water into drums. The DWR order also required that Aircraft Painting Inc. install and operate a pretreatment system for wash water prior to discharge to the Milleville WWTP. Mr. Iwasz stated that Pollution Abatement Consultants (PAC) has been contacted to design a treatment system suitable to meet Milleville WWTP standards.

Mr. Iwasz has also contacted Grave Resources Inc. to dispose of the drummed wash water and paint sludges. To date, no final arrangements have been made for disposal of

attachment A

the accumulated wash water. Once the treatment system is installed, no wash water will accumulate on site.

This inspector informed Mr. Iwasz that his company would have to obtain an EPA ID number under generator status if analysis reveals that the wash water and paint sludges are in fact a hazardous waste.

Photos and samples

One sample of the ½ drum of paint sludges was obtained using a plastic scoop. This sample was assigned DEP #BL041.

No photos were taken.

William Lowry
Env. Spec.

Investigator: B. Lowry Date: 6/21/82

in compliance

Purpose: (1) Invest. disposal of solvent/paint sludge, (where does it go for disposal - check shipping receipts). (2) Obtain sample of this sludge for ana
(3) DWR is handling disposal of washdown water going to sewer, (see or
* (4) Determine as best you can if this guy is a "small quantity generator"

Pictures: [X] Yes [ ] No Samples: [X] Yes [ ] No

Location:

Name: Aircraft Painting Inc.

Street: (located at Millville Airport)

Town: Millville

County Company: Cumberland

Phone No.:

Individuals to Contact:

Name: Joe Douglass DWR 2-1871

Street: Terry Ostrander - "spills" 2-5560

Town: Phone No.: Affiliation:

Report Due By: Week of 6/28/82

06-17

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO Files through Messrs. Hamilton and Miller

FROM Joseph Douglass DATE May 20, 1982

SUBJECT Field investigation of Organic Contamination in Millville Municipal Well #3

On May 6, 1982, a field investigation was conducted by this writer in an attempt to determine the source of the contamination of Millville municipal well #3 (see attached materials).

Mr. Frank DeMaris of the Cumberland County Health Department accompanied me through most of the investigation. We arrived at the Millville Water Plant at 11:00 a.m. where we met Mr. Jack Harris, licensed water plant operator, and Mr. Sumner Lippincott, Commissioner of Public Affairs. The events of March 29 and 30, 1982, were discussed in detail and two significant findings were made:

1. Well #3 had been out of service for approximately eight months prior to the sampling of March 30, 1982, which indicated that the well was contaminated with volatile organics.

2. Well #3 was only run for approximately two minutes prior to sampling on March 30, 1982.

I later asked Millville's sewage treatment plant operator Bob Engles if he had observed significant quantities of solvents entering his plant from the sanitary collection system. He said he had not.

At 1:00 p.m., Mr. DeMaris and I, accompanied by two Millville City employees, went to the ditch which receives the discharge from a storm sewer draining a portion of the Millville airport. The bottom of the ditch had a gray-green coloring, which dissipated downstream. The flow coming from the storm sewer was clear, with no trace of odor or contamination. Approximately ¼ mile downstream, a green film was found on the surface of the water. This film had a slight odor of organic solvent, as was confirmed by all present. The ditch had gradually dwindled in size as we walked downstream, indicating that some of the flow had percolated to the ground water. We did not follow the ditch to the end as the ground became marshy and the underbrush thick. We walked back upstream and opened the closet manhole in the storm sewer to the discharge point. The flow was clear, and there was a green coloring to the concrete beneath the water level in the line. We later found that the green coloring was also present at the second manhole upflow, but definitely not at the third and uppermost manhole in the line.

fogged p. 11 L. #3, 5

attach

At 1:30 p.m., we met Mr. Chris Andrews, of Airwork Inc., Mr. Andrews gave us a tour of the facility, which included machine shops, assembly shops, plating shops, and testing areas for jet engines. The plant area is completely paved and stormwater enters the storm sewer in question via several drains. The facility is served by a sanitary sewer line from the Millville STP for disposal of domestic wastewater. Many 55 gallon steel drums were observed in and around the facility, which contained solvents, degreasers, lubricants, etc. For the most part, these drums were kept in a satisfactory manner. Approximately fifteen drums were observed next to the uppermost manhole of the storm sewer line in question. The labels on these drums indicated that they contained a product called Borzin, made by the Turco Chemical Company. The ingredients were listed on the labels as chlorinated hydrocarbons. Mr. Andrews said that Borzin is an additive for degreasing solutions, and that these drums contained used solvent ready for disposal. He told me that all hazardous wastes generated by Airwork are disposed of by Grave Resources Inc., and proper manifesting procedures are taken. However, the Borzin drums must be considered as a possible source of the organic contaminants found March 29 and 30.

At 2:45 p.m., I went unaccompanied to Aircraft Painting Inc., located in an old hanger which is served by the storm sewer line in question. I met Jim Iwasz, co-owner of the business, who explained to me the process for stripping and painting aircraft. He said that approximately three planes per month are stripped and repainted, and that 18-20 gallons of solvent are used in stripping the paint from an average sized plane. The solvent is directly applied to the plane by sprayguns, and the paint soon coagulates and falls off the plane in globs. One of the planes in the hanger had recently been sprayed with the solvent, and the paint appeared to be running down its sides. Another plane in the hanger had recently been painted with what appeared to be a green primer, whose color was very similar to that of the film found in the ditch and in the manholes of the storm sewer line. The concrete floor of the hanger is cleaned first by squeegee and the material collected is placed in a drum, then disposed of with the other trash. Paint and solvent residues are then washed off the concrete floor into a channel along the wall of the hanger which drains through two connections to the storm sewer in question. The only solvent used by Aircraft Painting Inc. is manufactured by the B&B Chemical Co., Inc. of Hialeah, Florida. The company lists the ingredients of this solvent as being 58% chlorinated solvent and 5% nitrogen compound. Mr. Iwasz told me that B&B has assured him that their product is environmentally safe, although various human toxicity data is included on the material safety data sheet provided by the company. I described the NJPDES program to Mr. Iwasz, and told him that a NJPDES permit is required for the discharge of process wastewater generated by Aircraft Painting Inc. I told Mr. Iwasz that I would contact him as soon as I consulted with superiors to determine the action that the Division would take in this matter.

60 gal. ws? solvent/mo

Based strictly on the observations made this day, it is this writer's opinion that Aircraft Painting Inc. is the major contributor of both organic solvent and paint residues to the storm sewer in question. However, without detailed chemical analyses of the contents of all drums observed at both facilities, it is impossible to scientifically determine which facility, if either, is responsible for the contamination of Millville municipal well #3.

E23:G8

#CG-17

State of New Jersey

DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WATER RESOURCES
P. O. BOX CN 029
TRENTON, NEW JERSEY 08625

ARNOLD SCHIFFMAN
DIRECTOR

MAY 17 1982

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Aircraft Painting, Inc.
Millville Municipal Airport
Millville, New Jersey 08732

Attention: Mr. J. Iwasz

Re: Discharge of Process Wastewaters
Millville, Cumberland County

Dear Mr. Iwasz:

A pollution investigation was conducted by this office at the Millville Airport on May 6, 1982. This investigation was made necessary by the recent discovery of volatile organic contamination in the airport's stormwater sewer system and nearby Millville City well #3.

During this investigation, it was found that the process wastewater from Aircraft Painting, Inc. is discharged to the stormwater sewer system in question. This method of wastewater disposal is governed by the Regulations Concerning the New Jersey Pollutant Discharge Elimination System (NJPDES), N.J.A.C. 7:14A-1 et seq., which state, "No person shall discharge any pollutant except in conformity with a valid NJPDES permit." Violators of these regulations are subject to penalties of $5,000 per violation and $500 per day of continued violation.

Aircraft Painting, Inc. is hereby directed as follows:

1. Immediately cease all discharges of process wastewater to the floor drains which lead to the airport's stormwater sewer system.

2. Within fourteen (14) days of the date of receipt of this Directive, submit to this office a complete list of the chemical components of the solvent manufactured by the B & B Chemical Company which is used by Aircraft Painting, Inc. to strip the paint from aircraft.

3. Within fourteen (14) days of the date of receipt of this Directive, submit to this office the proposed method by which the process wastewater generated by your facility shall be disposed of.

Notice is hereby given that failure to comply with this Directive will result in further enforcement action by this office, including the imposition of monetary penalties. Therefore, kindly devote your full attention to this matter.

If you have any questions, please contact this writer at (609) 292-1871.

Very truly yours,

Joseph Douglass
Environmental Specialist
Region VI
Enforcement & Regulatory Services Element

E23:G9

cc: Cumberland County Health Department
Sumner N. Lippincott
Jack Harris, Licensed Operator

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WASTE MANAGEMENT
BUREAU OF FIELD OPERATIONS

NO. ______

RECEIPT FOR SAMPLES

HW/EF N.R. 06-17

CASE NAME
AIRCRAFT PAINTING INC

LOCATION
MILLVILLE MUNICIPAL AIRPORT

NAME OF PERSON/COMPANY WHOM SAMPLE IS OBTAINED
JIM IWASZ

ADDRESS
MILLVILLE NJ

ITEM NR	QUANTITY	DESCRIPTION OF SAMPLES
BL041	1	A 950 BROWN GLASS JAR CONTAINING A MULTICOLORED LIQUID AND SLUDGE MATERIAL ASSIGNED DEP SAMPLE # BL041
		FINAL ITEM

CHAIN OF CUSTODY

ITEM NR	DATE	TIME	RELINQUISHED BY	RECEIVED BY	PURPOSE OF CHAIN OF CUSTODY
BL 041	6/29/82	1500 HRS	PRINT NAME WILLIAM LOWRY SIGNATURE William Lowry	PRINT NAME SIGNATURE	
			PRINT NAME SIGNATURE	PRINT NAME SIGNATURE	
			PRINT NAME SIGNATURE	PRINT NAME SIGNATURE	
			PRINT NAME SIGNATURE	PRINT NAME SIGNATURE	

ADM-012

HW/EF 06-17

MEMO

NEW JERSEY STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION

TO File thru Dave Potts DHP

FROM William Lowry DATE 10/12/82

SUBJECT 6/29/82 Aircraft Painting investigation recommendations and comments.

1. The sample obtained is representative of what had been previously disposed of in the trash dumpster and taken to the Millville Landfill.

2. Aircraft Painting has ceased improper disposal of paint sludges and the floor wash water and is working on setting up proper disposal techniques.

3. Since accumulation of wash water is a temporary measure and the amount of paint sludges is reported to be one, 55 gallon drum/6 months, this facility should be treated as a small quantity generator.

William Lowry

William Lowry
Env. Spec.

* Due to fact that the paint sludges appear to be exempt from hazardous waste regulations due to small quantity exemption, the sample was not analyzed. (BL041) (DHP)

REGION: 02

U. S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE
DATA BASE UPDATED 04/06/04
T.1 - ERRIS TURNAROUND DOCUMENT

PAGE: 1,025
RUN DATE: 04/06/04
RUN TIME: 23:13:52

SITE DATA
#########

EPA ID NO.: NJD096054229 SHEET 01

(ACTION : #_# - FOR DATA ENTRY USE ONLY)

SF ID: #___# #___# #___# SITE NAME: AIRCRAFT PAINTING SOURCE: R SOURCE COUNTS:

#___# #___# STREET: MILLVILLE ARPT (BEACON AVE) CONG. DIST: 02 NOTIS: 0

NATL PRIORITY: N CITY: MILLVILLE ST: NJ ZIP: 08332-_____ STS: 0

HRS: #____.__# CNTY NAME: CUMBERLAND CNTY CODE: 011 HWDMS: 0

HRS DATE (YY/MM): #___/___# LATITUDE: 39/23/54.0 LONGITUDE: 075/02/10.0 COMPOSITE: 0

RESPONSE TERMINATION (CHECK ONE IF APPLICABLE): PENDING #_# NO FURTHER ACTION #_# OTHER: 0

ENF. DISP. (CHECK ANY THAT APPLY): NO VIABLE RESP. PARTY #_# VOL. RESP. #_# ENF. RESP. #_# COST RECOV. #_#

RSPO NAME: #________________________# RSPO PHONE: #___-___-____# FED. FAC. (Y/N): N NON-SITE: #_#

SMSA: 8760 USGS HYDRO. UNIT: 02040206 REG. FLD1: #_______# REG. FLD2: #_#

SITE DESCRIPTION: #____#

#____#

#____#

#____#

EVENTS
######

	(ACTION - FOR DATA ENTRY USE ONLY)	EVENT TYPE	DATE (YY/MM) STARTED	DATE (YY/MM) COMPLETED	EPA	STATE	RESP/PARTY	OTHER	COUNTS
					- - - - -CONDUCTED BY			- - - -	
RESPONSE EVENTS	#_#	SITE DISCOVERY (SD)		#___/___#					
	#_#	PRELIMINARY ASSESSMENT (PA)	#___/___#	#___/___#	#_#	#_#			
	#_#	SITE INVESTIGATION (SI)	#___/___#	#___/___#	#_#	#_#			
	#_#	REMEDIAL ACTION (RD)	#___/___#	#___/___#	#_#	#_#	#_#	#_#	#___#
	#_#	REMOVAL ACTION (RV)	#___/___#	#___/___#	#_#	#_#	#_#	#_#	#___#
ENFORCE. EVENTS	#_#	ENFORCEMENT INVESTIGATION (EI)	#___/___#	#___/___#	#_#	#_#		#_#	
	#_#	ADMINISTRATIVE ORDER (AO)	#___/___#	#___/___#	#_#	#_#		#_#	
	#_#	JUDICIAL ACTION (JA)	#___/___#	#___/___#	#_#	#_#		#_#	

REGION: 02

U. S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE
DATA BASE UPDATED 04/06/04
T.1 - ERRIS TURNAROUND DOCUMENT

PAGE: 1,026
RUN DATE: 04/06/04
RUN TIME: 23:13:52

EPA ID NO.: NJD096054229 SHEET 02

...TE NAME: AIRCRAFT PAINTING

... AND ALIAS LOCATION DATA
########################

...ALIAS (ACTION #_# - FOR DATA ENTRY USE ONLY)

...NO.: #___# ALIAS NAME: #______________________________________# SOURCE: # #

EPA ID NO.: NJD096854229 SHEET 02

SITE NAME: AIRCRAFT PAINTING

ALIAS AND ALIAS LOCATION DATA

ALIAS (ACTION *__* - FOR DATA ENTRY USE ONLY)

SEQ. NO.: *___* ALIAS NAME: *______________________________________* SOURCE: *__*

ALIAS LOCATION (ACTION *__* - FOR DATA ENTRY USE ONLY)

CONTIGUOUS PORTION OF SITE: *__*

STREET: *____________________________* CONG. DIST.: *___*

CITY: *________________________* ST: *___* ZIP: *_____-____*

CNTY NAME: *________________________* CNTY CODE: *___*

LAT: *__/__/__.__* LONG.: *___/__/__.__* SMSA: *____* USGS HYDRO. UNIT: *________*

ALIAS (ACTION *__* - FOR DATA ENTRY USE ONLY)

SEQ. NO.: *___* ALIAS NAME: *______________________________________* SOURCE: *__*

ALIAS LOCATION (ACTION *__* - FOR DATA ENTRY USE ONLY)

CONTIGUOUS PORTION OF SITE: *__*

STREET: *____________________________* CONG. DIST.: *___*

CITY: *________________________* ST: *___* ZIP: *_____-____*

CNTY NAME: *________________________* CNTY CODE: *___*

LAT: *__/__/__.__* LONG.: *___/__/__.__* SMSA: *____* USGS HYDRO. UNIT: *________*

EPA ID NO.: NJD096854229 SHEET 03

SITE NAME: AIRCRAFT PAINTING

SITE COMMENTS

(ACTION - FOR DATA ENTRY USE ONLY)	COMMENT NUMBER	COMMENT
__	*___*	*____*

REGION: 02

U. S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE
DATA BASE UPDATED 04/06/04
T.1 - ERRIS TURNAROUND DOCUMENT

PAGE: 1,827
RUN DATE: 04/06/04
RUN TIME: 23:13:52

EPA ID NO.: NJD096854229 SHEET 03

SITE NAME: AIRCRAFT PAINTING

SITE COMMENTS
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(ACTION - FOR DATA ENTRY USE ONLY)	COMMENT NUMBER	COMMENT
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REGION: 02

U. S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE
DATA BASE UPDATED 04/06/04
T.1 - ERRIS TURNAROUND DOCUMENT

PAGE: 1,828
RUN DATE: 04/06/04
RUN TIME: 23:13:52

EPA ID NO.: NJD096854229 SHEET 04

SITE NAME: AIRCRAFT PAINTING

REGIONAL ENTRIES
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(ACTION - FOR DATA ENTRY USE ONLY)	ENTRY CODE	DESCRIPTION	DATE1 (YY/MM/DD)	DATE2 (YY/MM/DD)	DATE3 (YY/MM/DD)	FREE FIELD

REGION: 02

U. S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF EMERGENCY AND REMEDIAL RESPONSE
DATA BASE UPDATED 84/06/04
T.I - ERRIS TURNAROUND DOCUMENT

PAGE: 1,028
RUN DATE: 84/06/04
RUN TIME: 23:13:52

EPA ID NO.: NJD096054229 SHEET 04

SITE NAME: AIRCRAFT PAINTING

REGIONAL ENTRIES
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(ACTION - FOR DATA ENTRY USE ONLY)	ENTRY CODE	DESCRIPTION	DATE1 (YY/MM/DD)	DATE2 (YY/MM/DD)	DATE3 (YY/MM/DD)	FREE FIELD
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_	*___.__*	*___*	*__/__/__*	*__/__/__*	*__/__/__*	*___*
_	*___.__*	*___*	*__/__/__*	*__/__/__*	*__/__/__*	*___*
_	*___.__*	*___*	*__/__/__*	*__/__/__*	*__/__/__*	*___*
_	*___.__*	*___*	*__/__/__*	*__/__/__*	*__/__/__*	*___*
_	*___.__*	*___*	*__/__/__*	*__/__/__*	*__/__/__*	*___*
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_	*___.__*	*___*	*__/__/__*	*__/__/__*	*__/__/__*	*___*

PRELIMINARY ASSESSMENT FILE SEARCH

NJDEP

DIVISION OF WATER RESOURCES:

A. Enforcement no

B. Groundwater no

C. Other

DIVISION OF WASTE MANAGEMENT:

A. HSMA yes

B. Enforcement yes

C. Solid Waste

ENVIRONMENTAL QUALITY:

A. Air Pollution no

B. Pesticides no

C. Other

DIVISION OF FISH AND GAME:

OFFICE OF SCIENCE AND RESEARCH:

A. Industrial Survey no

B. Other

N.J. DEPARTMENT OF HEALTH:

LOCAL AUTHORITIES:

A. Health Department

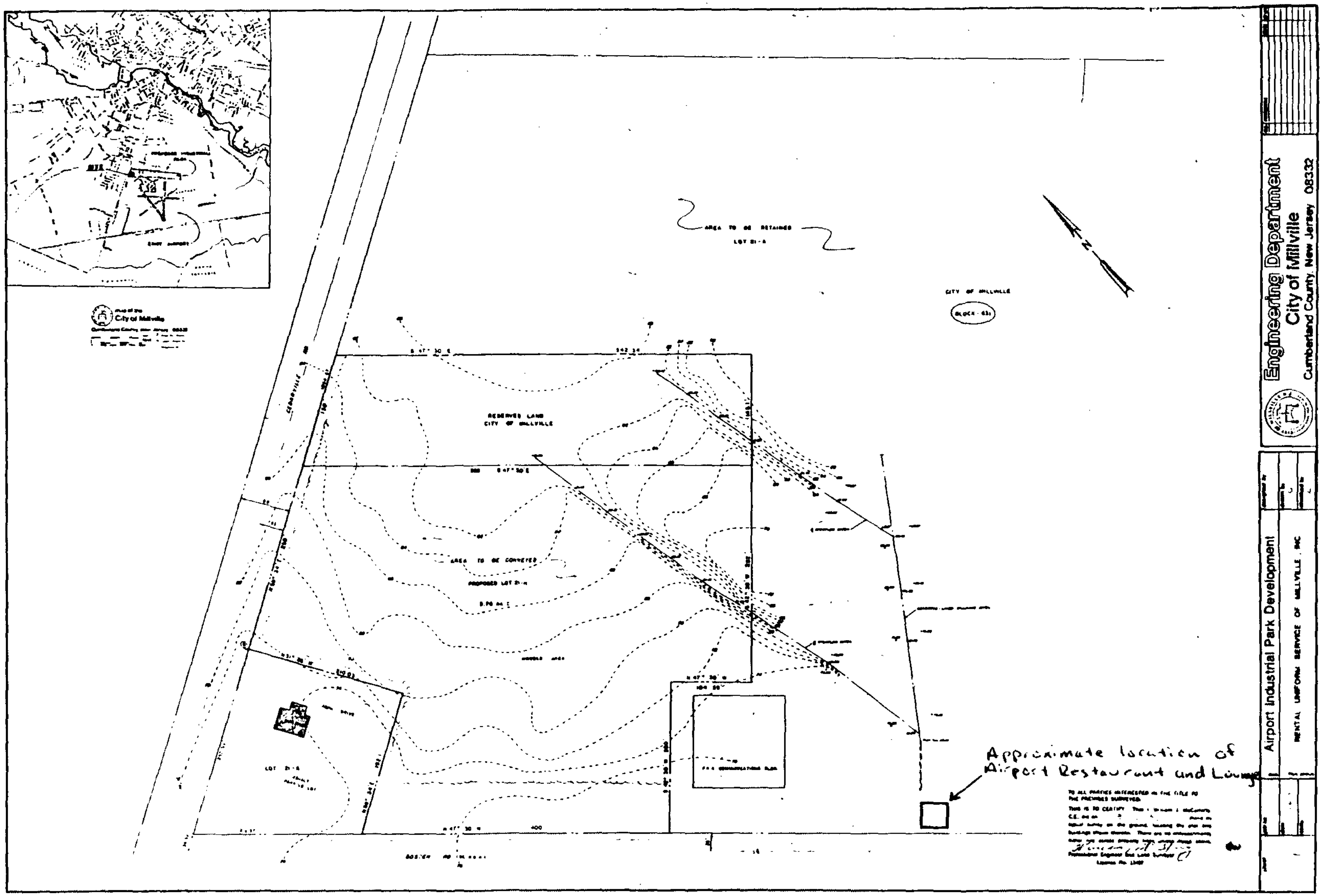
B. Town or County Clerk no

UNITED STATES GOVERNMENT:

A. EPA

B. other

REFERENCE NO. 6



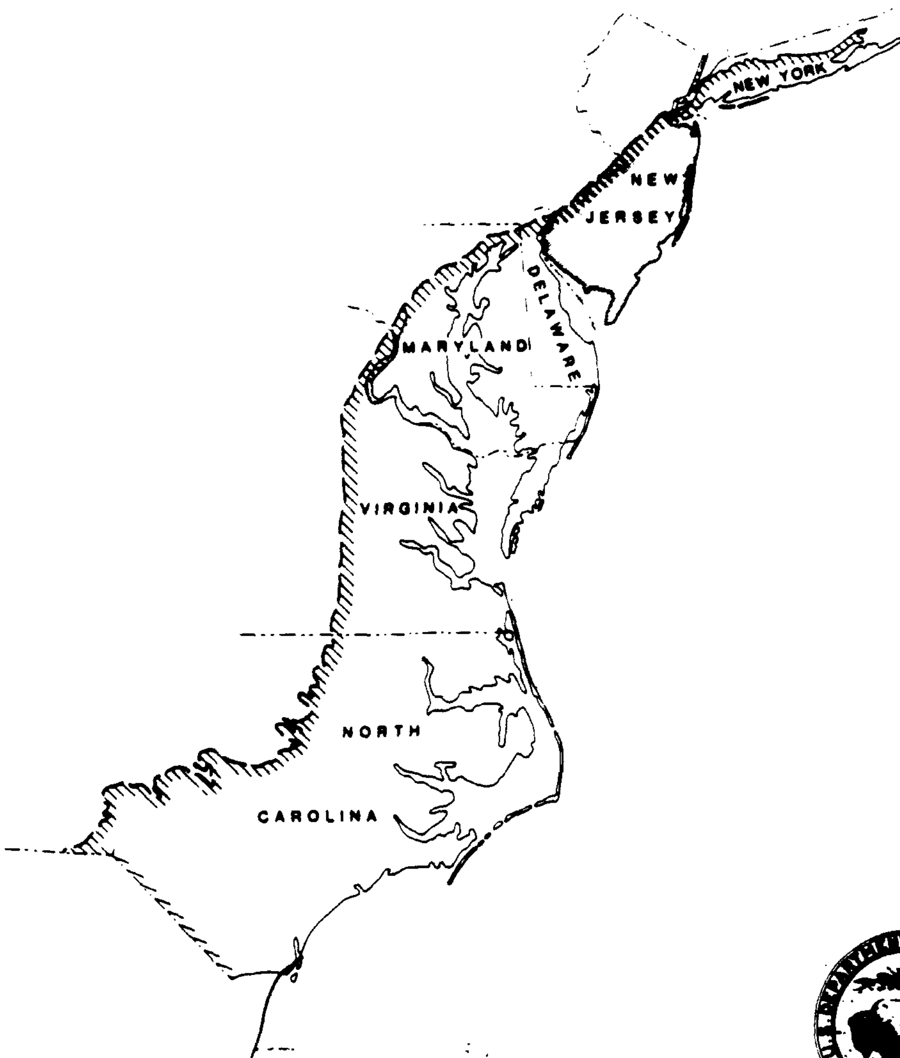
City of Millville
AREA TO BE RETAINED
CITY OF MILLVILLE
RESERVED LAND
CITY OF MILLVILLE
AREA TO BE CONVEYED
Approximate location of Airport Restaurant and Lounge
Engineering Department
City of Millville
Cumberland County, New Jersey 08332
Airport Industrial Park Development
RENTAL UNIFORM SERVICE OF MILLVILLE, INC

REFERENCE NO. 7

HYDROGEOLOGIC FRAMEWORK OF THE NEW JERSEY COASTAL PLAIN

REGIONAL AQUIFER-SYSTEM ANALYSIS

U.S. GEOLOGICAL SURVEY
Open-File Report 84-730



HYDROGEOLOGIC FRAMEWORK OF THE NEW JERSEY COASTAL PLAIN

By Otto S. Zapecza

Open-File Report 84-730

Trenton, New Jersey
1984

Formation, and the basal clay of the Kirkwood Formation. The Vincentown Formation functions as an aquifer within 3 to 10 miles downdip of its outcrop area. In areas farther downdip the Vincentown Formation functions as a confining bed. The Piney Point aquifer is laterally persistent from the southern New Jersey Coastal Plain northward into parts of Burlington and Ocean Counties. The Atlantic City 800-foot sand of the Kirkwood Formation can be recognized in the subsurface along coastal areas of Cape May, Atlantic, and southern Ocean Counties, but inland only as far west as the extent of the overlying confining bed. In areas west of the extent of the overlying confining bed, the Kirkwood Formation is in hydraulic connection with the overlying Cohansey Sand and younger surficial deposits and functions as an unconfined aquifer.

INTRODUCTION

Purpose and Scope

This report is the product of an intensive study of New Jersey Coastal Plain borehole geophysical data made, in part, to develop a hydrogeologic framework for use in the U.S. Geological Survey's Northern Atlantic Coastal Plain Regional Aquifer System Analysis (RASA) project. A 10-layer ground-water flow model of the New Jersey Coastal Plain aquifer system was constructed based on the information presented in this report. The same information forms part of the basis of the hydrogeologic framework for a 10-layer regional flow model of the northern Atlantic Coastal Plain from Long Island to North Carolina. Correlation of stratigraphic units in the various states of the Northern Atlantic Coastal Plain is shown in table 1.

The purpose of this report is to define, on a regional basis, the subsurface occurrence and configuration of hydrogeologic units (aquifers and confining beds) in the New Jersey part of the Atlantic Coastal Plain. This multilayer system is shown in a series of structure contour maps, isopach maps, and hydrogeologic sections based primarily on the interpretation of geophysical logs. Past efforts to understand the hydrology of the Coastal Plain's ground-water resources have been limited by the lack of a regional hydrogeologic framework. Documentation of the occurrence and geometry of the major aquifers and confining beds provides a firmer basis for more realistic water-management decisions.

Location and Extent

The New Jersey Coastal Plain extends from Delaware Bay in the southwest to Raritan Bay in the northeast, and from the Fall Line in the west to the Atlantic Ocean in the east (fig. 1). It is approximately 4,200 mi^2 and is part of the larger Atlantic Coastal Plain that extends from Florida to Newfoundland and eastward to the edge of the Continental Shelf. The area of study includes all of Monmouth, Burlington, Ocean, Camden, Gloucester,

Table 1.--Generalized stratigraphic-correlation chart of the Northern Atlantic Coastal Plain.

ERA	SYSTEM	SERIES	NORTH CAROLINA	VIRGINIA	MARYLAND	DELAWARE	NEW JERSEY	NEW YORK
Cenozoic	Quaternary	Pleistocene	Unnamed	Undifferentiated deposits	Undifferentiated deposits	Undifferentiated deposits	Cape May Formation Undifferentiated deposits	Upper Pleistocene deposits Gardners Clay Jameco Gravel
	Teritary	Pliocene	Chowan River Fm Yorktown Formation	Chesapeake Group: Chowan River Fm Yorktown Formation	Chesapeake Group: Yorktown Formation	Undifferentiated deposits		Mannetto Gravel (Pliocene?)
		Miocene	Pungo River Formation Belgrade Formation	Chesapeake Group: Eastover Formation St. Marys Formation Choptank Formation Calvert Formation	Chesapeake Group: Eastover Formation / Brandywine Formation St. Marys Formation Choptank Formation Calvert Formation	Chesapeake Group undivided	Pensauken Formation Bridgeton Formation Cohansey Sand Kirkwood Formation	
		Oligocene	River Bend Formation	Unnamed				
		Eocene	Castle Hayne Formation	Chickahominy Formation Piney Point Formation Nanjemoy Formation	Piney Point Formation Nanjemoy Formation	Piney Point Formation Nanjemoy Formation	Piney Point Formation Shark River Formation Rancocas Group: Manasquan Formation	
		Paleocene	Beaufort Formation	Marlboro Clay Aquia Formation Brightseat formation	Aquia Formation Brightseat Formation	Rancocas Group: Vincentown Formation Hornerstown Fm	Rancocas Group: Vincentown Formation Hornerstown Sand	
Mesozoic	Cretaceous	Upper Cretaceous	Peedee Formation Black Creek Formation Middendorf Formation Cape Fear Formation	Mattaponi Formation	Severn Formation Matawan Formation Magothy Formation	Severn Formation Mount Laurel Sand Marshalltown Formation Englishtown Formation Woodbury Clay Merchantville Formation Magothy Formation	Monmouth Group: Tinton Sand Red Bank Sand Navesink Formation Mount Laurel Sand Matawan Group: Wenonah Formation Marshalltown Fm Englishtown Fm Woodbury Clay Merchantville Fm Magothy Formation Raritan Formation	Monmouth Group Matawan Group Magothy Formation Raritan Formation: Clay member, Lloyd Sand member
		Lower Cretaceous	Unnamed	Potomac Group: Patapsco Formation Patuxent Formation	Potomac Group: Patapsco Formation Arundel Formation Patuxent Formation	Potomac Group	Potomac Group	
	Jurassic (?)	Upper Jurassic(?)	Unnamed					

modified from Meisler, 1980, fig 4

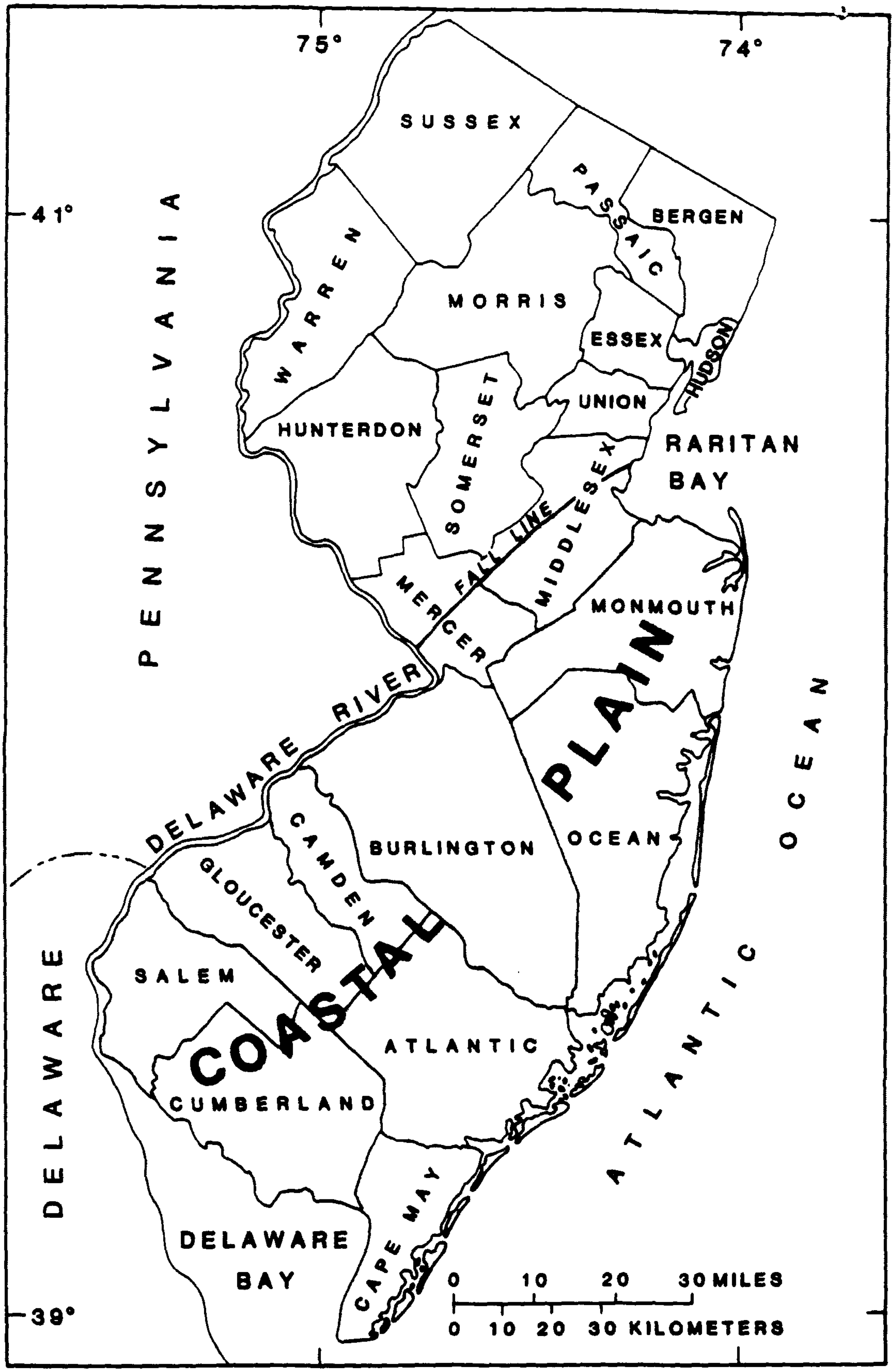


Figure 1.--Location of study area.

Salem, Atlantic, Cumberland, and Cape May Counties, and parts of Middlesex and Mercer Counties.

Previous Investigations

Subsurface stratigraphic relationships within the Coastal Plain of New Jersey have been documented in a number of previous studies. Richards (1945) presented a series of geologic cross sections outlining the subsurface stratigraphy of the Atlantic Coastal Plain. Richards and others (1962) produced generalized structure contour maps of geologic units of the New Jersey Coastal Plain. Detailed Cretaceous subsurface stratigraphy has been delineated by Perry and others (1975) and Petters (1976). Brown, Miller, and Swain (1972) presented structural contour maps, geohydrologic maps, and cross sections for 17 chronostratigraphic units in the Coastal Plain from North Carolina to New York.

Numerous county ground-water reports contain subsurface information, including contour maps and cross sections for local hydrogeologic systems. These include Monmouth County (Jablonski, 1968), Ocean County (Anderson and Appel, 1969), Burlington County (Rush, 1968), Camden County (Farlekas and others, 1976), Gloucester County (Hardt and Hilton, 1969), Salem County (Rosenau and others, 1969), and Cape May County (Gill, 1962).

Structure-contour maps for the pre-Cretaceous basement, Potomac-Raritan-Magothy aquifer system, and the Merchantville-Woodbury confining bed were presented by Gill and Farlekas (1976). Previously mapped hydrogeologic units in the northern part of the New Jersey Coastal Plain include the Farrington aquifer (Farlekas, 1979), the Englishtown aquifer (Nichols, 1977b), and the Wenonah-Mount Laurel aquifer (Nemickas, 1976). Nemickas and Carswell (1976) presented stratigraphic and hydrogeologic data for the Piney Point aquifer in the southern Coastal Plain of New Jersey.

Well-numbering System

The well-numbering system on the index map, tables, and hydrogeologic sections in this report is based on the numbering system used by the U.S. Geological Survey in New Jersey since 1978. The well number consists of a county code number and a sequence number assigned to the well within the county. Code numbers for the New Jersey Coastal Plain counties are:

1......	Atlantic	21......	Mercer
5......	Burlington	23......	Middlesex
7......	Camden	25......	Monmouth
9......	Cape May	29......	Ocean
11......	Cumberland	33......	Salem
15......	Gloucester		

A representative well number is 15-137 for the 137th well inventoried in Gloucester County.

Acknowledgments

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SUMMARY OF NEW JERSEY COASTAL PLAIN GEOLOGY

Structural Setting

The New Jersey Coastal Plain is a seaward-dipping wedge of unconsolidated sediments that range in age from Cretaceous to Holocene (table 2). These sediments, for the most part, are composed of clay, silt, sand, and gravel and are classified as continental, coastal, or marine-type deposits. The Cretaceous and Tertiary sediments generally strike northeast-southwest and dip gently to the southeast from 10 to 60 ft/mi. Overlying deposits of Quaternary age, where present, are essentially flat lying. The Coastal Plain deposits thicken seaward from a featheredge at the Fall Line to more than 6,500 ft at the southern tip of Cape May County (Gill and Farlekas, 1976).

The initial deposition of Coastal Plain sediments began during the Late Jurassic or Early Cretaceous after the formation of the early Atlantic Ocean (Sheridan, 1974a, p. 465). During the Mesozoic and Cenozoic Eras, block-faulting of the basement created highs and lows on the basement surface along the Atlantic Continental Margin (Sheridan, 1974a, p. 401). These basement highs and lows had a direct influence on sediment accumulation and dispersal patterns (Owens and Sohl, 1969, p. 237). Three basement tectonic features recognized in the New Jersey Coastal Plain are the Raritan embayment, South Jersey uplift, and the Salisbury embayment (pl. 1). Individual units generally are thicker in the embayment areas and depositional facies changes are common between adjacent tectonic features (Olsson, 1978, p. 941).

The pre-Cretaceous basement-bedrock complex that lies unconformably beneath the unconsolidated Coastal Plain deposits consists mainly of Precambrian and lower Paleozoic rocks. Locally, along the Fall Line (fig. 1) in Mercer and Middlesex Counties, Triassic rocks underlie the unconsolidated sediments. The altitude of the top of the bedrock surface is shown on plate 1. Contours showing the basement surface in areas where the depth to bedrock is 1,000 ft or less are based primarily on well and test hole data, whereas in downdip areas the primary control is based on seismic data (Gill and Farlekas, 1976).

Depositional History

The oldest group of sediments deposited on the basement surface within the Coastal Plain of New Jersey consists of Cretaceous continental deposits of the Potomac Group (table 2). This unit consists of alternating clay, silt, sand, and gravel and

Table 2.--Geologic and hydrogeologic units in the Coastal Plain of New Jersey.

SYSTEM	SERIES	GEOLOGIC UNIT	LITHOLOGY	HYDROGEOLOGIC UNIT	HYDROLOGIC CHARACTERISTICS
Quaternary	Holocene	Alluvial deposits	Sand, silt, and black mud	Undifferentiated	Surficial material, often hydraulically connected to underlying aquifers. Locally some units may act as confining beds. Thicker sands are capable of yielding large quantities of water.
		Beach sand and gravel	Sand, quartz, light-colored, medium- to coarse-grained, pebbly.		
	Pleistocene	Cape May Formation	Sand, quartz, light-colored, heterogeneous, clayey, pebbly.		
Tertiary	Miocene	Pensauken Formation			
		Bridgeton Formation		Kirkwood-Cohansey aquifer system	A major aquifer system. Ground-water occurs generally under water-table conditions. In Cape May County the Cohansey Sand is under artesian conditions.
		Beacon Hill Gravel	Gravel, quartz, light colored, sandy.		
		Cohansey Sand	Sand, quartz, light-colored, medium to coarse-grained, pebbly; local clay beds.		
		Kirkwood Formation	Sand, quartz, gray and tan, very fine- to medium-grained, micaceous, and dark-colored diatomaceous clay.	confining bed Rio Grande w-bz[1] confining bed	Thick diatomaceous clay bed occurs along coast and for a short distance inland. A thin water-bearing sand occurs within the middle of this unit.
				Atlantic City 800-foot sand	A major aquifer along the coast.
				Composite confining bed	Alloway Clay member or equivalent
	Eocene	Piney Point Formation	Sand, quartz and glauconite, fine- to coarse-grained.	Piney Point aquifer	Yields moderate quantities of water locally.
		Shark River Formation	Clay, silty and sandy, glauconitic, green, gray and brown, fined-grained quartz sand.		Poorly permeable sediments.
		Manasquan Formation			
	Paleocene	Vincentown Formation	Sand, quartz, gray and green, fine- to coarse-grained, glauconitic, and brown clayey, very fossiliferous, glauconite and quartz calcarenite.	Vincentown aquifer	Yields small to moderate quantities of water in and near its outcrop area.
		Hornerstown Sand	Sand, clayey, glauconitic, dark green, fine- to coarse-grained.		Poorly permeable sediments.
Cretaceous	Upper Cretaceous	Tinton Sand	Sand, quartz, and glauconite, brown and gray, fine- to coarse-grained, clayey, micaceous.	Red Bank sand[2]	Yields small quantities of water in and near its outcrop area.
		Red Bank Sand			
		Navesink Formation	Sand, clayey, silty, glauconitic, green and black, medium- to coarse-grained.		Poorly permeable sediments.
		Mount Laurel Sand	Sand, quartz, brown and gray, fine- to coarse-grained, slightly glauconitic.	Wenonah-Mount Laurel aquifer	A major aquifer.
		Wenonah Formation	Sand, very fine- to fine-grained, gray and brown, silty, slightly glauconitic.		
		Marshalltown Formation	Clay, silty, dark greenish gray, glauconitic quartz sand.	Marshalltown-Wenonah confining bed	A leaky confining bed.
		Englishtown Formation	Sand, quartz, tan and gray, fine- to medium-grained; local clay beds.	Englishtown aquifer system	A major aquifer. Two sand units in Monmouth and Ocean Counties.
		Woodbury Clay	Clay, gray and black, micaceous silt.	Merchantville-Woodbury confining bed	A major confining bed. Locally the Merchantville Fm. may contain a thin water-bearing sand.
		Merchantville Formation	Clay, glauconitic, micaceous, gray and black; locally very fine-grained quartz and glauconitic sand.		
		Magothy Formation	Sand, quartz, light-gray, fine- to coarse-grained; local beds of dark-gray lignitic clay.	Potomac-Raritan-Magothy aquifer system: upper aquifer	A major aquifer system. In the northern Coastal Plain the upper aquifer is equivalent to the Old Bridge aquifer and the middle aquifer is the equivalent of the Farrington aquifer. In the Dela. River Valley three aquifers are recognized. In the deeper subsurface, units below the upper aquifer are undifferentiated.
		Raritan Formation	Sand, quartz, light-gray, fine- to coarse-grained, pebbly, arkosic, red, white, and variegated clay.	conf bd middle aquifer	
	Lower Cretaceous	Potomac Group	Alternating clay, silt, sand, and gravel.	conf bd lower aquifer	
Pre- Cretaceous		Bedrock	Precambrian and lower Paleozoic crystalline rocks, metamorphic schist and gneiss; locally Triassic basalt, sandstone and shale.	Bedrock confining bed	No wells obtain water from these consolidated rocks, except along Fall Line.

[1] Rio Grande water-bearing zone.

[2] ------ Minor aquifer not mapped in this report.

Modified from Seaber, 1965, table 3.

is a major part of the thick sedimentary wedge in the Salisbury embayment area of extreme southern New Jersey. The overlying Raritan Formation consists of fluvial-continental deposits in outcrop and in the shallow subsurface that are lithologically similar to the Potomac Group sediments. However, in downdip areas near the coast, glauconite and shell beds indicate that the Raritan Formation is mostly marine (Richards, 1961, p. 1755, and Petters, 1976, p. 92). The Magothy Formation unconformably overlies the Raritan Formation and is a sheetlike deposit composed primarily of coarse beach sand and other associated near-shore marine deposits (Perry and others, 1975, p. 1535).

Upper Cretaceous and most Tertiary sediments overlying the Magothy Formation were deposited in various shelf and beach environments caused by alternating transgressive and regressive seas. Glauconite is common in this part of the geologic section and is indicative of mid- to outer-shelf deposition (Owens and Sohl, 1969, p. 259). Silty and clayey glauconitic sands are generally considered to form in marine environments characterized by slow rates of clastic sedimentation (Owens and Sohl, 1973, p. 2833). According to Olsson (1975, p. 17), much of the glauconite originated from the fecal pellets of mud-burrowing organisms and formed in the mud substrates of these deeper offshore areas.

Heavy concentrations of glauconite in association with very fine grained sediments are recognized in the New Jersey Coastal Plain as transgressive deposits, which formed during major incursions of the sea. Such units include the Merchantville, Marshalltown, and Navesink Formations, the Hornerstown Sand, and the Manasquan Formation. In contrast, coarsening-upward sequences that overlie the major glauconitic units are termed regressive beds. These beds were deposited in inner-shelf, near-shore, and beach areas during the slow retreat of the sea. Such units include the Englishtown Formation, Wenonah Formation, Mount Laurel Sand, Red Bank Sand, Vincentown Formation, Kirkwood Formation, and the Cohansey Sand. Generally, transgressive deposits form confining beds within the Coastal Plain and the regressive deposits form aquifers.

The long period of marine deposition in the study area ended after the deposition of the Miocene Cohansey Sand (Carter, 1978, p. 934). Continental deposition returned to the Coastal Plain during late Tertiary and Quaternary times. The Beacon Hill, Bridgeton, Pensauken, and Cape May Formations are primarily composed of fluvial sands and gravels (Owens and Minard, 1979, p. D1).

HYDROGEOLOGIC FRAMEWORK

Methods of Correlation

Most regional subsurface mapping in the New Jersey Coastal Plain has been based on formal geologic (rock-stratigraphic) and chronologic (time-stratigraphic) units that have been defined by

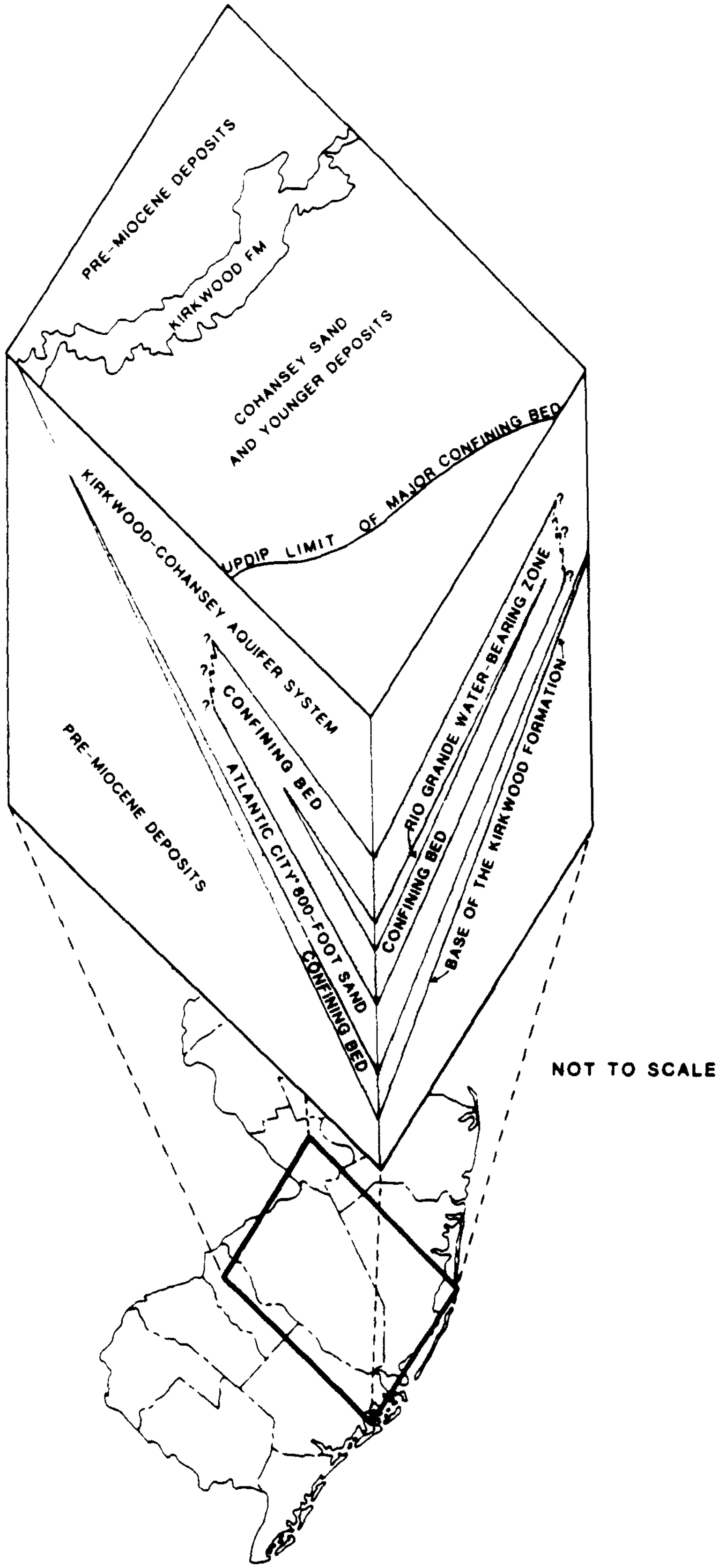


Figure 5.--Block diagram showing the presumed stratigraphic relationship between the Kirkwood-Cohansey aquifer system and the Atlantic City 800-foot sand.

and structure contour maps of this unit are not given in this report. Tops and thicknesses of the Rio Grande water-bearing zone can be calculated from the hydrogeologic sections.

The Rio Grande water-bearing zone is utilized mainly in southern Cape May County, where aquifer thicknesses can exceed 100 ft. It is generally less than 40 ft thick throughout much of the coastal areas in southern Ocean and Atlantic Counties. The aquifer is seldom used outside of southern Cape May County and is of minor importance. Therefore, in this report, the Rio Grande water-bearing zone has been included as part of the confining bed overlying the 800-foot sand shown on plate 22.

Kirkwood-Cohansey Aquifer System

The Kirkwood-Cohansey aquifer system is predominantly a water-table aquifer that underlies an area of approximately 3,000 mi^2 southeast of the updip limit of the outcrop of the Kirkwood Formation. This aquifer system is composed of the Kirkwood Formation, Cohansey Sand, and, depending on location, can include overlying deposits of the Beacon Hill Gravel, Bridgeton Formation, and Cape May Formation (Rhodehamel, 1973). The Kirkwood-Cohansey aquifer system is confined by overlying Pleistocene deposits on the peninsular part of Cape May County.

The lithology of the Kirkwood Formation, as indicated previously, is variable. Along coastal areas thick clay beds are dominant with interbedded zones of sand and gravel. In the subsurface, updip from the coast, fine to medium sand and silty sand are common, and regionally extensive clay beds occur only in the basal part of the formation.

The Cohansey Sand, also of Miocene age, is coarser grained than the underlying Kirkwood Formation. It is predominantly a light-colored quartz sand containing minor amounts of pebbly sand, fine- to coarse-grained sand, silty and clayey sand, and interbedded clay (Rhodehamel, 1973, p. 24). Some local clay beds within the Cohansey Sand are relatively thick. Locally, perched water tables and semiconfined conditions can exist in the Kirkwood-Cohansey aquifer system.

Overlying the Cohansey Sand are the Beacon Hill Gravel and the Bridgeton Formation, both considered to be Miocene fluvial deposits (Owens and Minard, 1979). The Beacon Hill Gravel overlies the Cohansey Sand only in remnant patches on the highest hills between Clarksburg, Monmouth County, and Warren Grove, Ocean County, where it can be as much as 40 ft thick (Owens and Minard, 1979, p. D6). The coarse-grained sand and gravel of the Bridgeton Formation are more widespread and can generally add 30 to 50 ft of thickness to the aquifer system in parts of Camden, Gloucester, Salem, Cumberland, Atlantic, and Cape May Counties (Owens and Minard, 1979, p. D14).

Throughout most of Cape May County, the Pleistocene Cape May Formation directly overlies the Cohansey Sand. Gill (1962, p. 21) divided the Cape May Formation into four distinct environmental facies. In order of deposition they are: estuarine sand, estuarine clay, marine sand, and deltaic sand. Gill (1962, fig. 2) has shown that in the northern half of Cape May County and along the coast as far south as Stone Harbor, the Cohansey Sand is in hydraulic connection with the overlying marine and deltaic sand facies. The marine sand facies of the Cape May Formation adds as much as 100 ft to the thickness of the Kirkwood-Cohansey aquifer system in the northern half of Cape May County. On the peninsular part of Cape May County, the Cohansey Sand is generally in hydraulic connection with the estuarine sand facies but is confined by the overlying estuarine clay facies (Gill, 1962, fig. 2). The estuarine clay facies generally ranges from 25 to 125 ft in thickness (Gill, 1962, p. 27).

The base of the Kirkwood-Cohansey aquifer system is shown on plate 23. The map illustrates two major regional basal surfaces for the water-table aquifer. The two surfaces are differentiated by the double-dashed line representing the approximate westward limit of the major confining bed overlying the Atlantic City 800-foot sand. The basal surface for the Kirkwood-Cohansey aquifer system west of this line is the top of the clay bed lying within the lower part of the Kirkwood Formation. This clay bed, as shown on hydrogeologic sections F-F' (pl. 4) and L-L' (pl. 5), is the updip extension of the confining bed underlying the 800-foot sand, and is probably the equivalent of the Alloway Clay Member of the Kirkwood Formation described by Nemickas and Carswell (1976).

The basal surface east of the double-dashed line is the top of the thick diatomaceous clay bed that overlies the Atlantic City 800-foot sand. The discontinuity in the structure contours on the base of the unconfined system at the double-dashed line is caused by the presence of this clay bed. The base of the aquifer system directly updip from the northwestern limit of the confining bed generally lies more than 350 ft below sea level. At Egg Harbor City, Atlantic County, several miles downdip from the western limit of the confining bed, the base of the water-table aquifer is only 160 ft below sea level. The difference in altitudes of the two basal surfaces of the Kirkwood-Cohansey aquifer system is shown diagrammatically in figure 5.

The thickness of the confining bed underlying the Kirkwood-Cohansey aquifer system west of the double-dashed line is shown on plate 18 as the composite confining bed. If, in more detailed studies, the Vincentown and Piney Point aquifers are considered to be important, the thickness of the confining bed between the base of the unconfined aquifer and these minor aquifers can be calculated by comparing the maps of the tops of the Vincentown (pl. 19) and Piney Point (pl. 20) aquifers with the base of the Kirkwood-Cohansey aquifer system west of the double-dashed line (pl. 23).

It is important to note that the Cohansey Sand is a confined aquifer beneath the peninsular portion of Cape May County. However, on plate 23, structure contours have been extended throughout Cape May County to illustrate the base of the confined Cohansey Sand. Information regarding the water-table system in Cape May County can be found in Gill (1962).

The extent of the confining bed overlying the Atlantic City 800-foot sand partly determines the thickness of the Kirkwood-Cohansey aquifer system. An abrupt change in the thickness of the Kirkwood-Cohansey aquifer system at the double-dashed line is shown on plate 24. The water-table aquifer thickens downdip from less than 50 ft at the Kirkwood outcrop to more than 400 ft near the edge of the upper confining bed of the Atlantic City 800-foot sand. In areas where this clay bed occurs in the subsurface, the aquifer thickness ranges from about 140 ft along the northwestern extent of the clay bed to approximately 400 ft in the Atlantic City area.

The aquifer-thickness map for the Kirkwood-Cohansey aquifer system represents not only the saturated thickness of the water-table aquifer but also the unsaturated section. The thickness of the aquifer at each control point represents the total thickness of the unit calculated by subtracting the depth of the basal confining bed from the altitude of land surface.

SUMMARY AND CONCLUSIONS

The Coastal Plain of New Jersey is a seaward-dipping wedge of unconsolidated sediments that range in age from Cretaceous to Quaternary. These sediments are composed of clay, silt, sand, and gravel and include continental, coastal, and marine-type deposits.

Hydrogeologic units described in this report can differ from formal stratigraphic units because a geologic formation can contain more than one aquifer, a formation may function as an aquifer in one area and as a confining bed in another, or an aquifer or confining bed may be composed of several geologic formations.

The occurrence and configuration of 15 regional hydrogeologic units have been defined within the Coastal Plain of New Jersey based on the interpretation of borehole geophysics data. Structure-contour maps and aquifer thickness maps are provided for nine aquifers listed in ascending order:

1. Lower aquifer of the Potomac-Raritan-Magothy aquifer system
2. Middle aquifer of the Potomac-Raritan-Magothy aquifer system
3. Upper aquifer of the Potomac-Raritan-Magothy aquifer system
4. Englishtown aquifer system
5. Wenonah-Mount Laurel aquifer
6. Vincentown aquifer
7. Piney Point aquifer

8. Atlantic City 800-foot sand
9. Kirkwood-Cohansey aquifer system

Thickness maps are provided for six confining beds listed in ascending order:

1. Confining bed between the lower and middle aquifers of the Potomac-Raritan-Magothy aquifer system
2. Confining bed between the middle and upper aquifers of the Potomac-Raritan-Magothy aquifer system
3. Merchantville-Woodbury confining bed
4. Marshalltown-Wenonah confining bed
5. Composite confining bed
6. Confining bed overlying the Atlantic City 800-foot sand

The structure-contour and thickness maps are supplemented by 14 hydrogeologic sections that show vertical and horizontal relationships among the 15 hydrogeologic units.

The major points presented by this hydrogeologic framework are:

1. The Potomac-Raritan-Magothy aquifer system is divided into five mappable units of varying extent. The five units include three aquifers, designated as lower, middle, and upper, and two confining beds that lie interjacent to the aquifers.

2. The lower aquifer of the Potomac-Raritan-Magothy aquifer system is defined in the subsurface near the outcrop area between Burlington and Salem Counties.

3. The middle aquifer of the Potomac-Raritan-Magothy aquifer system occurs over the same area as the lower aquifer, but is also laterally continuous in the subsurface of the northern Coastal Plain of New Jersey where it is equivalent to the Farrington aquifer.

4. The upper aquifer of the Potomac-Raritan-Magothy aquifer system is mapped in the subsurface throughout the Coastal Plain southeast of the outcrop area of the Magothy Formation. The upper aquifer is equivalent to the Old Bridge aquifer in the northeastern Coastal Plain of New Jersey.

5. The Merchantville-Woodbury confining bed is the most extensive confining bed within the Coastal Plain. This unit functions as an effective confining bed between the upper aquifer of the Potomac-Raritan-Magothy aquifer system and the Englishtown aquifer system. In areas where the Englishtown aquifer system is absent, the Merchantville-Woodbury confining bed effectively

confines the upper aquifer of the Potomac-Raritan-Magothy aquifer system from the Wenonah-Mount Laurel aquifer.

6. The Englishtown aquifer system primarily functions as a single aquifer but contains two water-bearing sands in parts of Monmouth and Ocean Counties. South of a line paralleling Forked River (Ocean County), Hammonton (Atlantic County), and Bridgeton (Cumberland County), the Englishtown aquifer system is not recognized on geophysical logs that penetrate the section.

7. The Marshalltown-Wenonah confining bed is a thin leaky unit that ranges in thickness from 20 to 80 ft. This confining bed lies between the Englishtown aquifer system and the Wenonah-Mount Laurel aquifer.

8. The Wenonah-Mount Laurel aquifer is identified in the subsurface throughout the New Jersey Coastal Plain southeast of the outcrop of the Mount Laurel Sand.

9. Sediments that overlie the Wenonah-Mount Laurel aquifer and that are subjacent to the major aquifers within the Kirkwood Formation and Cohansey Sand function primarily as a composite confining bed, but include minor aquifers, namely the Vincentown and Piney Point.

10. The Vincentown Formation functions as an aquifer within 3 to 10 mi downdip of its outcrop area. In areas further downdip the Vincentown Formation functions as a confining bed.

11. The Piney Point aquifer is laterally persistent from the southern Coastal Plain northward into Burlington and Ocean Counties. The name Piney Point aquifer replaces the name Manasquan Formation for this water-bearing unit in Burlington and Ocean Counties.

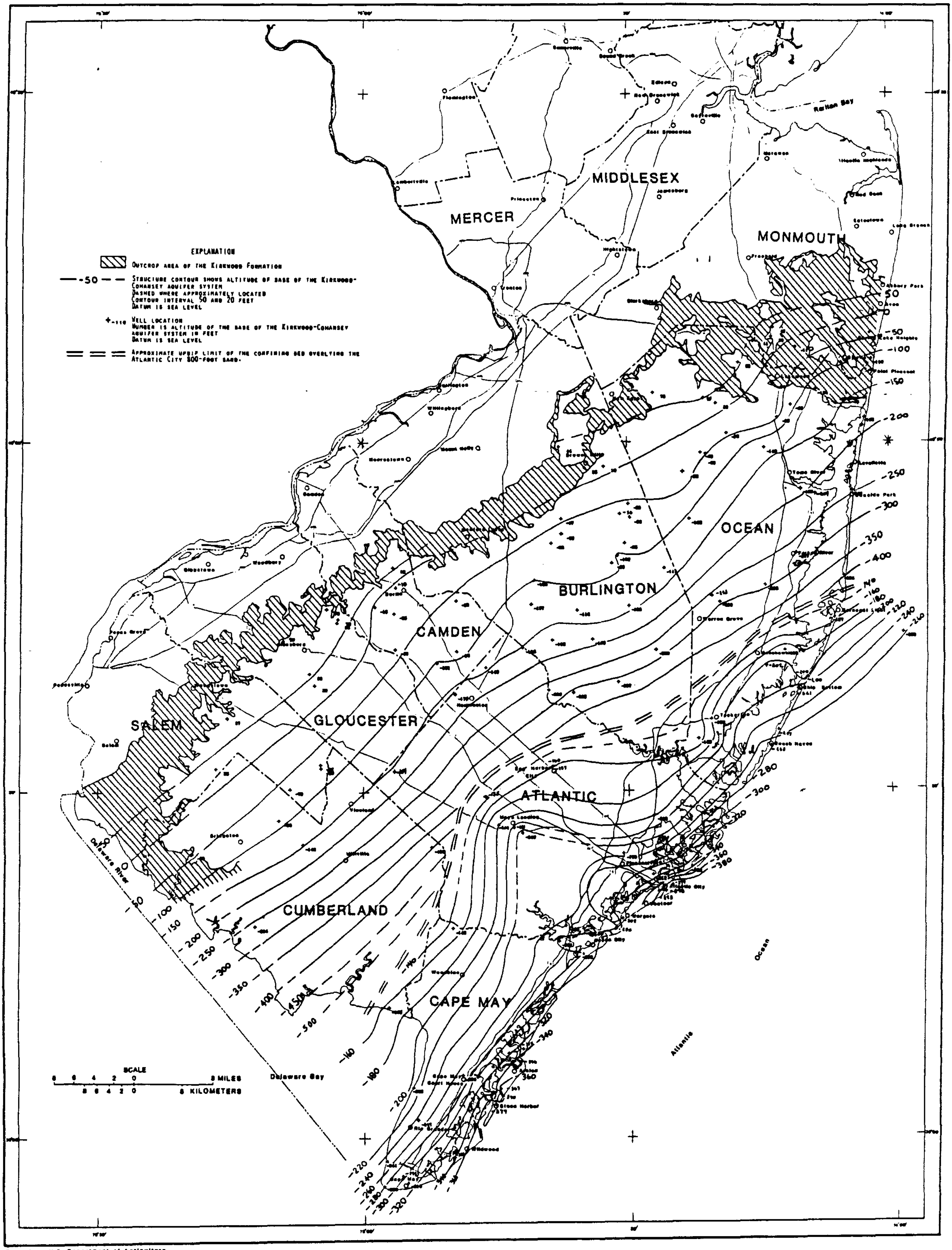
12. The Atlantic City 800-foot sand of the Kirkwood Formation can be recognized in the subsurface along coastal areas of Cape May, Atlantic, and southern Ocean Counties, but only as far west as the limit of the overlying confining bed. In areas west of the limit of the overlying confining bed, the Kirkwood Formation is in hydraulic connection with the overlying Cohansey Sand and younger surficial deposits and is an unconfined aquifer.

13. The Kirkwood-Cohansey aquifer system is predominantly a water-table aquifer that underlies an area of approximately 3,000 mi^2 southeast of the updip limit of the outcrop of the Kirkwood Formation. The aquifer

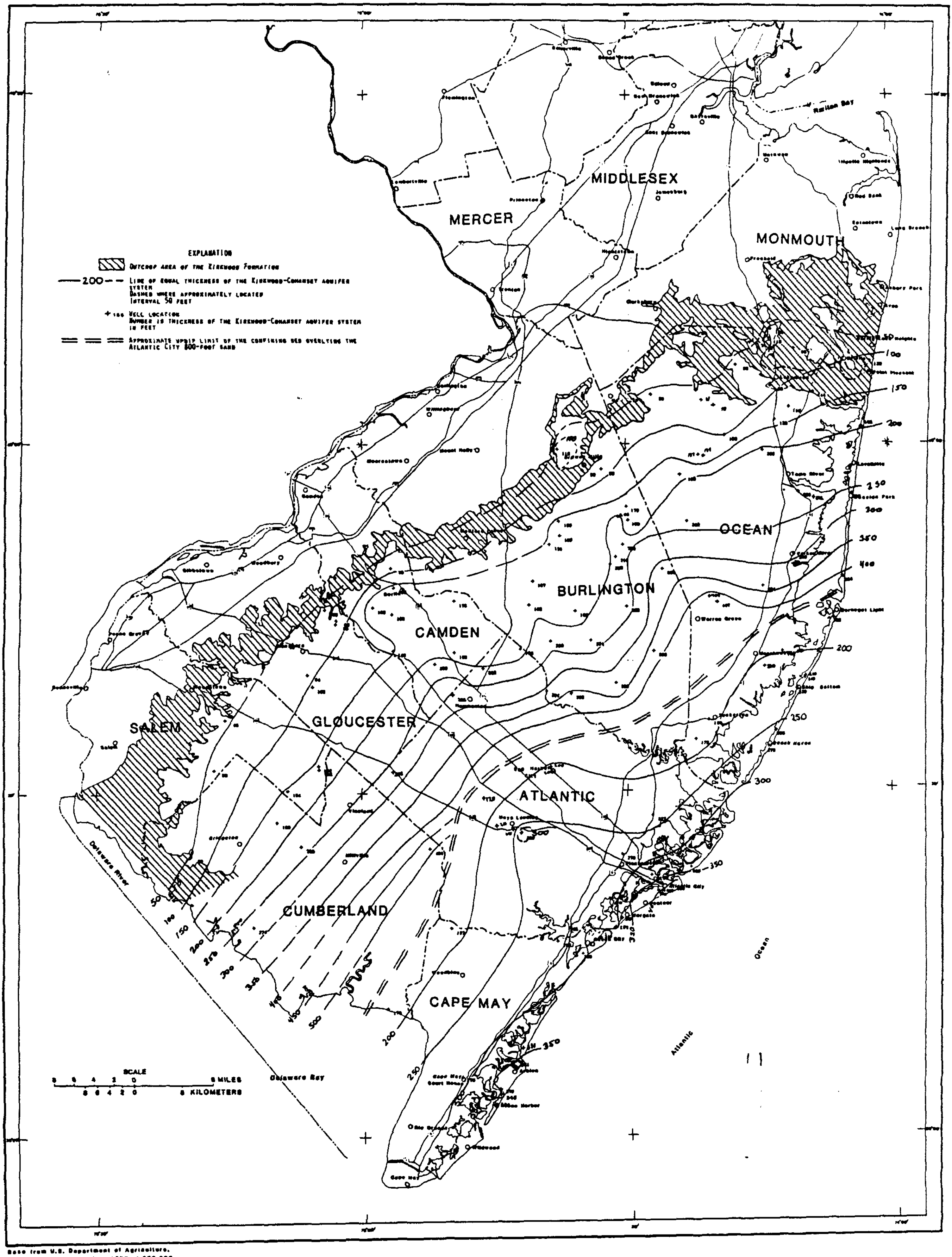
system is composed of the Kirkwood Formation, Cohansey Sand, and overlying deposits of the Beacon Hill Gravel, Bridgeton Formation, and Cape May Formation.

Table 4.--Altitudes of top and base of hydrogeologic units--Continued.
[In feet above or below sea level]

Well number	Altitude of land surface	Kirkwood-Cohansey aquifer system	Atlantic City 800-foot sand		Piney Point aquifer		Vincentown aquifer		Wenonah-Mount Laurel aquifer		Englishtown aquifer system		Potomac-Raritan-Magothy aquifer system: Upper aquifer		Potomac-Raritan-Magothy aquifer system: Middle aquifer		Potomac-Raritan-Magothy aquifer system: Lower aquifer	
		Base	Top	Base	Top	Base	Top	Base	Top	Base	Top	Base	Top	Base	Top	Base	Top	Base
7-469	105	-101	--	--	-167	--	--	--	--	--	--	--	--	--	--	--	--	--
7-476	111	-38	--	--	-100	-135	--	--	-378	-477	-502	-561	-687	-789	--	--	--	--
7-512	160	-25	--	--	--	--	--	--	-238	-360	-386	-410	-578	-660	--	--	--	--
7-516	10	--	--	--	--	--	--	--	--	--	--	--	--	-112	-124	-167	-203	-262
9- 2	5	-367	-795	-918	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 13	10	-315	-666	-886	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 19	6	-280	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 24	9	-241	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 33	15	-295	-645	-810	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 66	5	-247	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 89	7	-202	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9- 93	6	-264	-635	-790	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9-110	6	-280	-643	-809	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9-125	10	-300	-643	-803	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9-126	7	-324	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9-132	7	-377	-820	-954	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9-148	9	-281	-569	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9-149	12	-145	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9-159	5	-337	-784	-927	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9-166	5	-340	-789	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9-177	5	-346	-750	-905	--	--	--	--	--	--	--	--	--	--	--	--	--	--
9-181	22	--	-588	-768	-923	-1013	--	--	-1964	-1988	--	--	-2179	-2230	--	--	--	--
11- 44	80	-88	--	--	-196	-330	--	--	--	--	--	--	--	--	--	--	--	--
11- 72	12	-38	--	--	-146	-281	--	--	--	--	--	--	--	--	--	--	--	--
11- 96	10	-264	--	--	-343	-555	--	--	--	--	--	--	--	--	--	--	--	--
11-116	5	-165	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
11-132	91	-400	--	--	-479	-505	--	--	-1205	-1271	--	--	-1385	-1477	--	--	--	--
11-163	80	-149	--	--	-258	-424	--	--	--	--	--	--	--	--	--	--	--	--
15- 1	133	28	--	--	-68	-157	--	--	-287	-415	-445	-465	-609	--	--	--	--	--
15- 3	140	56	--	--	--	--	--	--	-226	-340	-368	-391	-529	--	--	--	--	--
15- 6	20	--	--	--	--	--	--	--	--	--	-54	-98	-200	--	--	--	--	--
15- 27	47	--	--	--	--	--	--	--	--	--	--	--	-89	--	--	--	--	--
15-131	130	--	--	--	--	--	--	80	20	-60	-86	-108	-230	--	--	--	--	--
15-137	29	--	--	--	--	--	--	--	--	--	--	--	-16	-89	-132	--	--	--
15-139	8	--	--	--	--	--	--	--	--	--	--	--	--	-50	-113	-188	-262	-340



Base from U.S. Department of Agriculture,
Soil Conservation Service, 1969, 1:250,000



Base from U.S. Department of Agriculture, Soil Conservation Service, 1969, 1:250,000

THICKNESS OF THE KIRKWOOD-COHANSEY AQUIFER SYSTEM, NEW JERSEY.

REFERENCE NO. 8

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION

DIVISION OF WATER RESOURCES

SPECIAL RE[illegible]

GROUND-WAT[illegible]

CUMBERLAND CO[illegible]

[illegible]

[illegible]

[illegible]

1971

GROUND WATER RESOURCES, CUMBERLAND COUNTY, N.J.

By

James G. Rooney
Hydrologist, U.S. Geological Survey
Water Resources Division
Trenton, N. J.

[illegible]

1972

New Jersey [illegible]

[illegible]

level measurements were made. Information on well use and pumpage data were obtained in the field and from files of the N. J. Division of Water Resources.

Previous Studies

Many workers have contributed to the knowledge of the ground-water resources of Cumberland County.

Minard and others (1955) mapped the soils of the county. The geologic formations in New Jersey were mapped and described by Lewis and Kümmel (Kümmel, 1940). The geologic map of New Jersey was later revised by Johnson (1950). The Quaternary formations covering much of the county were described by Salisbury and Knapp (1917).

Gill (1962) contributed significant new knowledge on the geology and hydrology of neighboring Cape May County that is partly applicable to Cumberland County. Remson and Fox (1954) investigated the possibilities of artificial recharge to the Cohansey Sand at a waste-water spreading area at Seabrook, N. J.

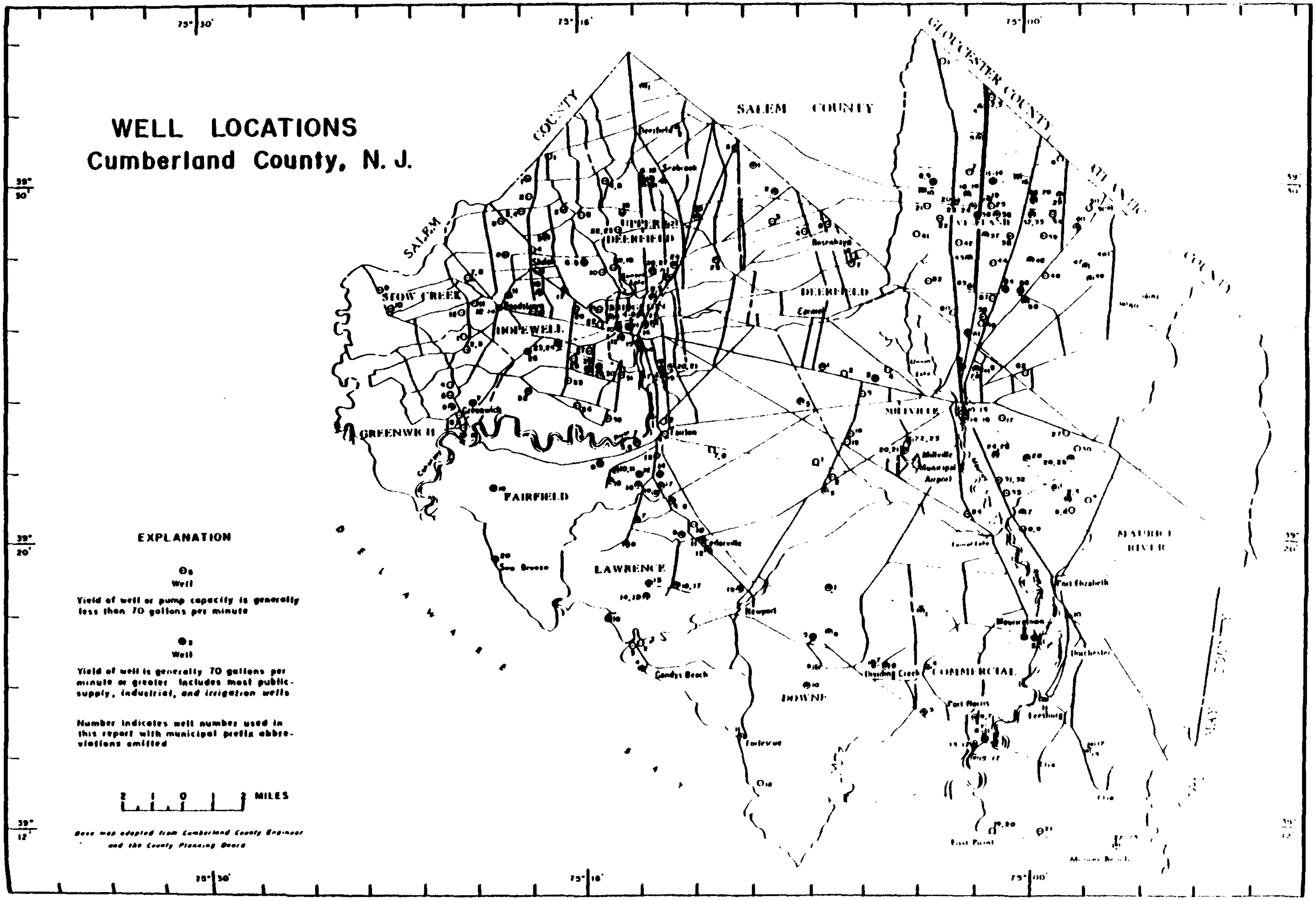
Acknowledgments

The author is grateful to many individuals and organizations, both public and private, for supplying useful information and assistance during this study. Particular acknowledgment is made to the Cumberland County Planning Board. Well records and logs were made available largely from the New Jersey Division of Water Resources, Bureau of Geology and Topography. Well drillers furnished well records and drilling samples and many industrial and private well owners furnished information on water use and made their wells available for tests and the collection of water samples.

Well-Numbering System

The wells used in this report are grouped by municipality--township, city, or borough-- and are numbered serially, generally starting from the northwesterly margins of each municipality. The number is prefixed with an abbreviation of the name of each municipality, as shown in the table below:

Name of municipality	Abbreviation	Name of municipality	Abbreviation
Bridgeton	Br	Lawrence Twp.	La
Commercial Twp.	Co	Maurice River Twp.	Mr
Deerfield Twp.	Dr	Millville	Ml
Downe Twp.	Dn	Shiloh Borough	Sh
Fairfield Twp.	Fa	Stow Creek Twp.	SC
Greenwich Twp.	Gr	Upper Deerfield Twp.	UD
Hopewell Twp.	Ho	Vineland	Vi



WELL LOCATIONS
Cumberland County, N. J.
EXPLANATION
Well
Yield of well or pump capacity is generally less than 70 gallons per minute
Well
Yield of well is generally 70 gallons per minute or greater. Includes most public-supply, industrial, and irrigation wells
Number indicates well number used in this report with municipal prefix abbreviations omitted
2 1 0 1 2 MILES
Base map adapted from Cumberland County Engineer and the County Planning Board
SALEM COUNTY
GLOUCESTER COUNTY
STOW CREEK
HOPEWELL
UPPER DEERFIELD
DEERFIELD
GREENWICH
FAIRFIELD
LAWRENCE
DOWNE
COMMERCIAL
MILLVILLE
MAURICE RIVER
Seabrook
Rosenhayn
Carmel
Greenwich
Fairton
Cedarville
Newport
Sea Breeze
Gandys Beach
Fortescue
Dividing Creek
Port Norris
Port Elizabeth
Mauricetown
Dorchester
Leesburg
East Point
Millville Municipal Airport
75°30'
75°15'
75°00'
39°30'
39°20'
39°12'

Piney Point Formation

The Piney Point Formation, the deepest known aquifer in the Tertiary System, occurs only in the subsurface in New Jersey. It overlies the Vincentown Formation and is in turn overlain by the Kirkwood Formation.

According to drillers' well logs, it consists mostly of fine- to medium-grained, glauconitic, salt-and-pepper colored, clayey sand, and contains layers of greenish-gray, silty clay. In the eastern part of the county the sand beds appear to be thinner and finer-grained and, therefore, probably less permeable than in the western part of the county (see Tables 5a and 6). The formation consists of glauconitic sand and greenish-gray clay in adjacent Salem County where it is about 94 feet thick, as indicated by the log of the test well at Elmer (Table 6).

The Piney Point Formation dips and thickens to the southeast. Near Stow Creek it is found at about 90 feet below land surface and is about 50 feet thick. In Millville it is believed to occur between 480 to 560 feet below land surface as determined from a test well (Well Ml-25 in Table 16).

The Piney Point Formation is tapped in Cumberland County by only a few wells in the western part of the county and along Delaware Bay. Yields of these wells are generally 100 gpm or less. Additional small to possibly moderately yielding wells (50 to 100 gpm) tapping this formation can be developed. However, if future development does occur, records should be kept of ground-water pumpage; water samples should be collected; and water levels should be measured periodically to monitor potential salt-water intrusion into presently fresh supplies.

Water from wells tapping the Piney Point Formation requires little to no treatment to be acceptable for domestic supplies. Table 8 presents a summary of chemical analyses of water from wells tapping this aquifer. However, the ground water probably becomes more saline with increasing depths and down dip toward Delaware Bay. Water from the deeper wells sampled in this investigation contains higher concentrations of sodium, chloride, and dissolved solids than does water from wells tapping shallower fresh ground water.

Kirkwood Formation and Cohansey Sand

The most heavily utilized aquifers in Cumberland County are in the Kirkwood Formation and in the Cohansey Sand. Probably more than 95 percent of the ground water pumped from wells in the county in 1964 came from two water-bearing units within these formations. These units are a lower Kirkwood aquifer (unit 2, described in the following section on geology) and the Cohansey-Kirkwood aquifer, in which the uppermost Kirkwood Formation and the overlying Cohansey Sand cannot be differentiated.

Geology

The Kirkwood Formation overlies the Piney Point Formation which is in turn overlain by the Cohansey Sand. The Kirkwood is generally poorly exposed throughout much of Cumberland County where it is largely concealed by the Cohansey Sand or by deposits of Pleistocene and Holocene age. Therefore the descriptions of the Kirkwood in Cumberland County in this report are based largely on well logs and samples of materials obtained from drilled wells. (See Tables 5 and 6).

Four hydrogeologic units can be recognized in the Kirkwood Formation in Cumberland County. From the oldest to the youngest they are: (1) a basal clay, (2) a lower water-bearing sand, (3) an intermediate clay, and (4) an upper water-bearing sand. Gill (1962, p. 17) divided the Kirkwood in Cape May County into five units. The four hydrogeologic units in Cumberland County are believed to be the same as the four deepest units in Cape May County. Gill's fifth and highest unit, a clay, was not identified in Cumberland County although it may occur below the Cohansey Sand in the eastern part of the county. In the western part of Cumberland County near the outcrop area, the top of the Kirkwood Formation has an irregular erosional surface, especially along Delaware Bay and in the major present-day stream channels (see Table 5a). For this reason, the four units in the Kirkwood could not be differentiated west of the Cohansey River.

The basal unit in Cumberland County is a dark gray, silty to sandy, micaceous clay with streaks of brown, very micaceous lignitic clay, which generally has a thin sandy layer of shells near the middle. The basal unit has a maximum known thickness of about 130 feet. The base of the unit (No. 1) dips to the southeast; it is found at about 150 feet below sea level in the northwestern part of the county and at about 600 feet below sea level near Millville in the southeastern part of the county.

The next higher unit (No. 2) overlying the basal clay is a water-bearing, gray, fine- to coarse-grained sand containing some gravel and shells. This unit, is referred to in this report as the lower Kirkwood aquifer. It ranges in thickness from about 10 to 90 feet.

The intermediate clay unit (No. 3) overlying the lower aquifer is a gray, silty to sandy, micaceous and lignitic clay. It is generally a semiconfining unit. In the central part of the county, it consists of silty to sandy clay through which water may leak between the lower water-bearing sand and the overlying Cohansey - Kirkwood aquifer. This intermediate clay unit is about 60 feet thick throughout much of Cumberland County.

The shallowest unit (No. 4) in the Kirkwood Formation in Cumberland County is generally a gray to brownish water-bearing sand. The sand is fine- to coarse-grained and is generally coarser grained and more permeable east of the Cohansey River than west of the river. This sand generally cannot be distinguished from the similar, lower water-bearing sands of the Cohansey Sand.

The Cohansey Sand in Cumberland County generally consists of medium- to coarse-grained sand with some clay and silt. Gravel is present throughout the formation but is locally concentrated near the base of well-defined channel deposits. Dark, massive, carbonaceous and micaceous, silty clay beds occur locally in the upper part of the Cohansey, particularly on the slopes and divides of the larger present-day drainage basins. Massive ironstone beds are common near the top of the formation. The color of the Cohansey varies from yellowish gray, light gray, brown, moderate red, to very dark red.

The Cohansey Sand and the upper water-bearing sand of the Kirkwood Formation act as a single hydrologic unit and are referred to in this report as the Cohansey-Kirkwood aquifer.

Thickness of this aquifer varies considerably. West of the Cohansey River and northward into Salem County it is about 50 feet thick or less. In Bridgeton, along the Cohansey River, it is about 100 feet thick but may include the more sandy units of the lower part of the Kirkwood (unit No. 2). In vineland the Cohansey-Kirkwood aquifer is as much as 180 feet thick (see Table 5).

The Cohansey-Kirkwood aquifer in the area between the Cohansey and Maurice Rivers generally is overlain by a sandy to silty clay layer in the Cohansey Sand. This layer is about 35 feet thick but thins towards the valleys and stream channels where the Cohansey-Kirkwood aquifer generally is overlain by sands of the Cape May Formation.

Hydrology

Lower Kirkwood aquifer.--Most of the wells tapping the lower Kirkwood aquifer in Cumberland County are located in the eastern half of the county and along the near-shore area of Delaware Bay. Depths of these wells range from about 200 to about 370 feet below land surface.

In 1969, most wells tapping the lower Kirkwood aquifer in Cumberland County yield less than 50 gpm. However, properly designed and constructed wells may yield as much as 400 gpm. For example, well Ml-12 in Millville had a specific capacity of 3.0 gallons per minute per foot of drawdown, and wells tapping the lower aquifer in the Port Norris area have specific capacities that average about 8.0 gpm per foot. The thickness and permeability of the aquifer and, consequently, its capacity to yield water to wells increases from near the Kirkwood outcrop area in Salem and Western Cumberland Counties eastward and southeastward toward Atlantic City and Cape May County.

Recharge to the lower Kirkwood aquifer probably comes mainly from vertical leakage from overlying aquifers, such as in the Cohansey River basin where the lower aquifer is found at relatively shallow depths. Some discharge from the lower aquifer is believed to occur as leakage upward to streams where the aquifer is near land surface and, by evapotranspiration in or near its outcrop areas. Additional discharge probably occurs as vertical leakage to the higher Cohansey-Kirkwood aquifer in the lowlands along the Maurice River and Delaware Bay. Along the Maurice River at Millville, static water levels in the lower aquifer are about 20 feet higher than in the Cohansey-Kirkwood aquifer indicating the potential for upward vertical leakage (Table 14, wells Ml 10, 11, 12). It should be noted that some water in the lower aquifer may move eastward from Cumberland County toward areas of heavy ground-water withdrawal along the Atlantic Coast such as toward the Atlantic City area where heavy pumpage has created a large cone of depression extending inland toward Cumberland County.

The general quality of water in the lower Kirkwood Formation aquifer is indicated in Table 9; individual chemical analyses of water from wells tapping the lower aquifer in the Kirkwood are shown in Table 15. The water is soft to moderately soft (30 to 77 mg/l) and generally needs little treatment except to remove high concentrations of iron. Iron content of the water is generally high (up to 1.9 mg/l) and is usually above the recommended maximum limits of the New Jersey Department of Health Potable Water Standards. Dissolved solids content ranges from 86 to 161 mg/l and chloride concentrations ranges from 2.4 to 4.2 mg/l. These low chloride and dissolved solids concentrations indicate that salt water is presently not a problem in the lower aquifer. Also, static water levels in the aquifer are generally well above sea level near Delaware Bay and, at present, the potential for intrusion of salt water is minimal.

Future development of the lower Kirkwood aquifer for additional fresh-water supplies in Cumberland County should proceed with caution. This aquifer in the Atlantic City area may be recharged with ground water flowing from Cumberland County. If this is the case, additional development in Cumberland County may reduce the amount of water available to the aquifer near Atlantic City.

Cohansey-Kirkwood aquifer.--The Cohansey-Kirkwood aquifer is generally the shallowest source of ground water throughout most of Cumberland County and is the most important source of water in the county. Nearly all (49.4 mgd in 1964) of the ground water used in the county comes from this aquifer. It is also particularly subject to surface contamination.

The water-bearing characteristics of the Cohansey-Kirkwood aquifer are not fully known. Transmissitivity was determined from a pumping test near Elmer in Salem County, to be about 30,000 gpd per ft of aquifer (Rosenau and others, 1969). As the aquifer is about 25 feet thick at this site, the permeability is about 1,200 gallons gpd per sq ft. The coefficient of storage was calculated to be about 3.0×10^{-4} indicating artesian or semi-artesian conditions at this site. Vertical leakage from adjacent semiconfining beds occurred during the test. Remson and Fox (1954), in a study of a waste water spreading area at Seabrook, determined that the permeability of the Cohansey Sand, (Cohansey-Kirkwood aquifer in this report), is about 2,700 gpd per sq ft and that the specific yield in the zone of water-level fluctuations is about 30 percent.

Because it is highly permeable and relatively thick, the Cohansey-Kirkwood aquifer is generally capable of yielding abundant supplies of water to wells. Large water supplies (300 to 1,200 gpm) of acceptable quality for public-supply systems, industrial facilities, and irrigation systems, can generally be obtained from wells that are less than 100 feet deep. Yields from large-diameter wells have been reported to be as much as 1,300 gpm (table 14, well Fa-3). Smaller domestic and commercial supplies (10-50 gpm) can generally be obtained from wells that are less than 100 feet deep. Some dug and driven wells that tap the aquifer for water are only 15 to 20 feet deep.

Specific capacities of large diameter wells tapping the Cohansey-Kirkwood aquifer in Cumberland County range from about 7 gpm per foot of drawdown to as high as 57 gpm per foot of drawdown (well UD-9); the average is about 20 gpm per foot of drawdown.

The great capacity of this aquifer to accept recharge has been shown by Remson and Fox (1954). At Seabrook approximately one billion gallons of food processing waste water, are disposed annually by spreading the water over a woodland tract, using large irrigation nozzles. Tests in the uncultivated woodland indicated infiltration capacities of 54, 57, and 75 inches per hour. Tests in a cultivated clover field indicated an infiltration rate of 4.6 inches per hour. The lower infiltration rate in the tilled soil is attributed by Remson and Fox (1954, p. 89) to several causes. These include "the presence of a plow sole" and the affect of cultivation on "soil aggregate and the plant and animal structure and channels."

Even after extended periods of heavy pumpage, water levels in the Seabrook Farms well field recover to near-normal conditions as shown by the hydrograph for Seabrook Farms Well No. 5 for 1951-52 (Figure 7). The wells in this field are all about 160 feet deep and have an average pumping level of about 70 feet below land surface. Lowest pumpage demands are generally in March (0.63 mgd), and maximum demands are in October (10.7 mgd). Water levels in Well UD-9 (Seabrook Farms No. 5) show no permanent depletion after a season of heavy pumpage. Long-term records from this well also show no water-level decline indicating a potential high rate of recharge to the aquifer. It is probable that water levels in wells penetrating similar materials in the Cohansey-Kirkwood aquifer recover seasonally throughout most of the county under present pumping and land-use conditions.

The Cohansey-Kirkwood aquifer is generally a water-table aquifer in Cumberland County. It is recharged principally from precipitation in the county; very little recharge to the aquifer comes from areas outside the county (see figure 3 and figure 8). Where the aquifer is partially confined by clayey layers of lower permeability, it is recharged principally by leakage around and possibly through these clay layers. Available data indicate that there is hydraulic interconnection throughout this water-bearing unit from the surface downward to about 180 feet below the surface in most of the county east of Bridgeton.

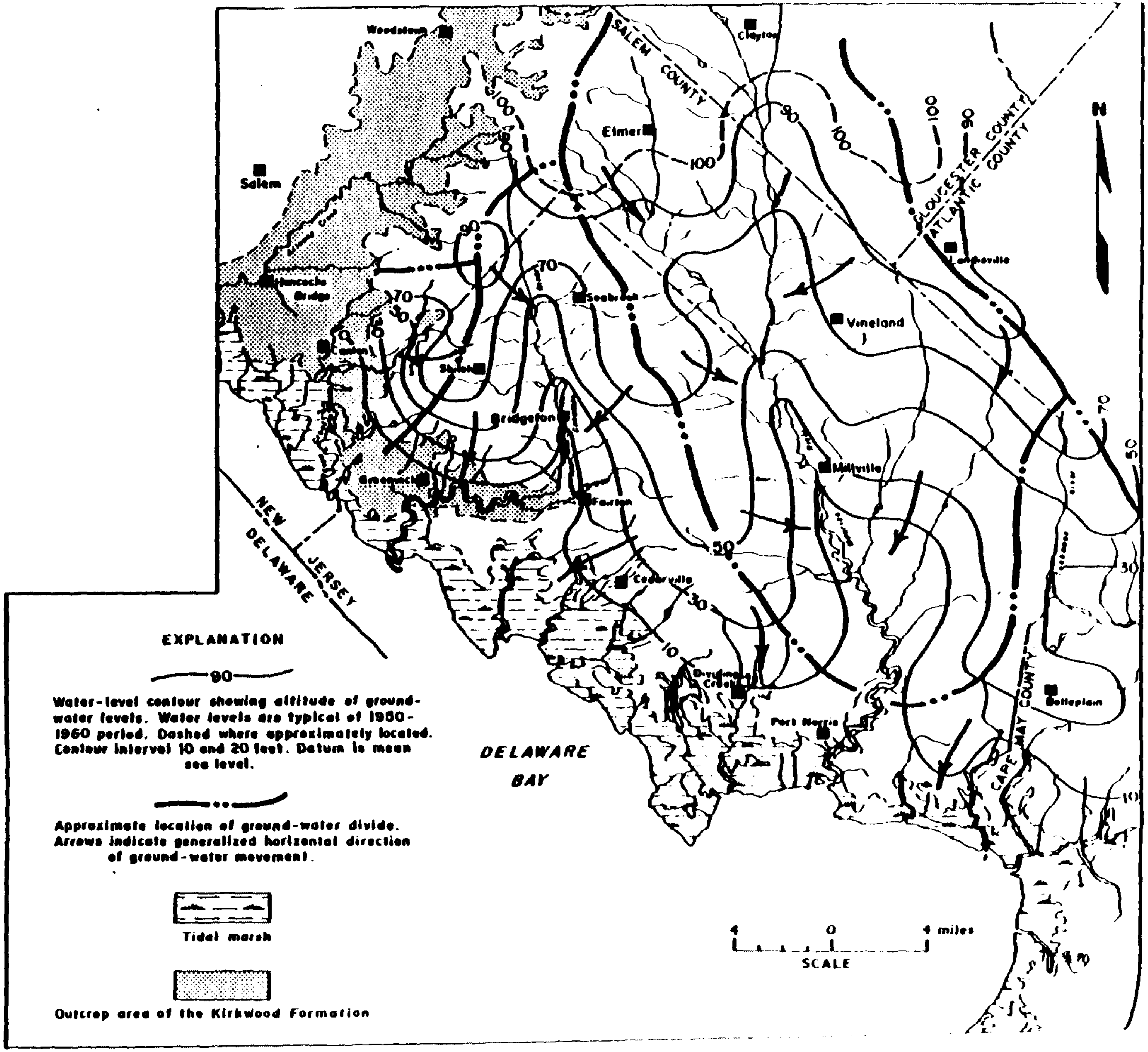
Areas of recharge and discharge, and the pattern of water movement in the Cohansey-Kirkwood aquifer in Cumberland County can be inferred from the generalized water-level map in figure 8. Lateral and deep percolating ground-water flow is from higher elevations in the northern parts of the county to lower areas along stream valleys and Delaware Bay. The water-level contours in figure 8 are based on typical water-levels during the period 1950-60 obtained from wells in upland areas and on data obtained from surface drainage elevations using U. S. Geological Survey 7½ minute quadrangle maps. The water level map in figure 8 should be used with caution, however, in any quantitative evaluation of the hydrology of the county, since water levels continually change in response to recharge and discharge.

The exact time of the year in which maximum storage occurs in the Cohansey-Kirkwood aquifer varies areally. Figure 9 shows hydrographs from three water-table wells located in different parts of the West Branch Cohansey River basin, in Cumberland County. Well SC-2 is located near the head waters about 0.6 miles from the river and about 2.5 miles upstream from its mouth. Well SC-4 is located about 0.7 miles from the river near the southwestern divide of the basin about 2.5 miles upstream from its mouth. Well HO-5 is located about 0.15 miles from the river on the southern flank of the basin about 0.6 mile upstream from its mouth.

The hydrographs show that highest water levels, and hence periods of greatest amounts of ground-water storage occur at different times of the year at each well. Maximum storage in the aquifer occurs earliest near the river as shown by the water levels in HO-5, while in SC-2 and SC-4 which are further from the river, maximum storage occurs several months later. At locations close to normally discharging areas and along streams, discharge from the aquifer comes into equilibrium with recharge more rapidly than at locations more distant from discharge areas. At the more distant locations, more time is required for recharge from precipitation to reach the zone of saturation and for water levels to rise high enough so that increased ground water gradients to the discharge area will permit discharge to equal recharge.

The quality of ground water in the Cohansey-Kirkwood aquifer is summarized in Table 10. Natural surface-water quality, typically, is similar to the ground-water quality in the Cohansey-Kirkwood aquifer as shown by the analysis of water from the Maurice River (Table 10).

The water in the Cohansey-Kirkwood aquifer is characterized by low dissolved solids, low hardness, and low pH values. Median values are 63 mg/l, 21 mg/l, and 5.5 pH units respectively. The characteristically low pH indicates the water is excessively corrosive. Corrosive water can dissolve cement building materials, iron and copper pipes, and plumbing fixtures and fittings, leading to possible leaks and costly repairs. Yellow to brown stains on fixtures and laundered clothing indicate water is high in iron concentration; light blue stains may indicate the presence of copper that may have been dissolved from plumbing equipment by corrosive water. Therefore, treatment to adjust pH from acidic values to more neutral values probably is desirable for most domestic or other potable well supplies from the Cohansey-Kirkwood aquifer in Cumberland County.


Woodstown
Clayton
SALEM COUNTY
GLOUCESTER COUNTY
ATLANTIC COUNTY
N
Elmer
Salem
Landisville
Hancocks Bridge
Seabrook
Vineland
Canton
Shiloh
Bridgeton
Millville
Greenwich
Fairton
Cedarville
NEW JERSEY
DELAWARE
Dividing Creek
Port Norris
Belleplain
CAPE MAY COUNTY
DELAWARE BAY
EXPLANATION
90
Water-level contour showing altitude of ground-water levels. Water levels are typical of 1950-1960 period. Dashed where approximately located. Contour interval 10 and 20 feet. Datum is mean sea level.
Approximate location of ground-water divide. Arrows indicate generalized horizontal direction of ground-water movement.
Tidal marsh
Outcrop area of the Kirkwood Formation
4 0 4 miles
SCALE

Iron concentrations in water samples from the Cohansey-Kirkwood aquifer ranged from 0.1 to 15 mg/l. Most water samples contained less than 3.0 mg/l of iron; the median concentration was 0.1 mg/l. Lowest concentrations of iron were found in samples from wells located in the upland areas of the county; highest concentrations were found in the lowlands. The maximum measured concentration of 15 mg/l is from a well (Vi-36) in Vineland that was contaminated by leaching of nearby industrial wastes.

Because the Cohansey-Kirkwood aquifer is generally under water-table conditions, it is particularly subject to surface contamination. Nitrate concentrations in water from the aquifer ranged from 0.0 to 65 mg/l; the median concentration was 0.7 mg/l. Nitrate concentrations higher than about 1.0 mg/l may indicate contamination resulting from land-use practices. Agricultural fertilizers and organic wastes leaching to the shallow aquifers are probably the principal sources of nitrates. High concentrations of aluminum, sulfate and chloride indicate contamination. Examples of contaminated ground water in Vineland and near Greenwich are shown in the analyses in Table 11.

Salt-water intrusion in the Cohansey-Kirkwood aquifer is presently not a serious problem in the county. Chloride concentrations are generally much less than the 250 mg/l recommended limit of the New Jersey State Department of Health for potable use. However, minor intrusion problems may occur seasonally along the lowlands near Delaware Bay and its tidal estuaries as shown by the chemical analysis (Table 11) from a shallow well (Gr 7) near Greenwich.

Bridgeton and Cape May Formations

The Bridgeton Formation of Pleistocene age covers much of Cumberland County, occurring generally as an older, higher level, terrace deposit than the Cape May Formation. Bridgeton deposits are found covering most of the flatter upland areas and basin divides in the northern, central, and northeastern parts of Cumberland County.

The altitude of the base of the Bridgeton ranges from about 140 feet near Elmer in Salem County to about 60 feet at Dividing Creek. According to Salisbury and Knapp (1917, p. 37-42), the base declines slightly toward the Cohansey River from both sides of the valley, suggesting that there was an ancestral valley in pre-Bridgeton time near the Cohansey River.

The Bridgeton Formation generally consists of reddish-brown to dull red, intermixed clayey silt, sand, and gravel and contains some thin layers of silty clay. The gravel is usually scattered throughout the Bridgeton rather than in well-defined layers. In some areas ironstone layers occur several feet below land surface. The formation ranges in thickness from about 0 to 30 feet.

The Bridgeton Formation is largely above the water-table in much of the upland areas of Cumberland County. It serves as a collecting unit for infiltrating recharge from precipitation to the underlying Cohansey-Kirkwood aquifer. Locally, however, infiltration may be impeded by silt and clay layers. Few wells tap the Bridgeton Formation for water supplies although some shallow wells may obtain small domestic supplies where the Bridgeton is part of the water-table aquifer.

The older Bridgeton Formation sediments were partially removed by erosion prior to the deposition of the Cape May Formation.

The Cape May Formation, of Pleistocene age, occurs in Cumberland County mainly in two belts. One belt parallels the Delaware Bay shore adjacent to the tidal marshes. This belt ranges up to about seven miles in width (see figure 3). A second belt, ranging up to about 2½ miles in width, extends up the Maurice River Valley to about the Gloucester County line. The altitude of the top of the formation ranges from near sea level along Delaware Bay to about 40 feet above sea level near Millville.

According to Gill (1962, p. 21), the Cape May Formation in Cape May County was probably deposited in three separate environments—estuarine, marine, and deltaic. The estuarine environment resulted in two distinct facies: a basal sand and an overlying black clay. Overlying the estuarine black clay in Cape May County are deltaic sediments consisting mainly of coarse-grained sand and fine gravel which Gill named the Holly Beach aquifer. Marine sediments in Cape May County are contemporaneous with the deltaic sediments in Cumberland County, the former occurring along Delaware Bay. The estuarine and deltaic sediments have been tentatively identified in Cumberland County. The marine sediments have not been recognized in Cumberland County. A typical log of materials found in the Cape May Formation is given in Table 12.

The thickness of the Cape May Formation ranges from about 0 to about 120 feet in Cumberland County.

The Cape May Formation is relatively unimportant as a source of large, fresh-water supplies in Cumberland County although it is an important aquifer to the southeast, in Cape May County. A few domestic wells tap local aquifers in the Cape May Formation in Cumberland County. Drillers' logs of wells (Table 12 and 14) indicate salty water occurs in the Cape May aquifers in the Mauricetown area and near-shore communities along Delaware Bay.

Tidal Marsh and Swamp Deposits

Tidal marshes and swamps are areas of considerable ground water discharge. They compose about 22 percent, or about 112 square miles of the county and are located mainly, adjacent to Delaware Bay and along the flood plains of larger streams extending about 5 to 12 miles inland from the shore of Delaware Bay (See figure 3).

Tidal marsh and swamp deposits are primarily a soft, compressible mixture of dark-gray and brown decomposed organic matter, silt and clay are as much as 15 feet thick along Delaware Bay. They are of Holocene age and overlie older Pleistocene alluvial and marine sediments of the Cape May Formation.

TABLE 14.--RECORDS OF SELECTED WELLS IN CUMBERLAND COUNTY, N. J.--Continued

Aquifer: CM, Cape May Formation
CM-KW, Cape May or Kirkwood
Ch-KW, Cohansey-Kirkwood
LKW, Lower Kirkwood
PP, Piney Point
MW, Mount Laurel and Wenonah
ET, Englishtown

Well numbers are listed by political subdivision and correspond with well numbers in figure 2

Well Number	Owner and Owner's Well Number	Location	Altitude of land surface (feet)	Drilling Contractor	Year Drilled	Total depth drilled (feet)	Diameter of casing (inches)	Aquifer	Screen setting (feet)	Well performance test: Yield (gpm)	Static water level (feet)	Drawdown (feet)	Specific capacity (gpm/ft of drawdown)	Date	Remarks
MAURICE RIVER TOWNSHIP--Continued															
MR- 5	New Jersey Silica Sand Co. (No. 1)	3,230 ft south of well no. 6	20	Haines & Moore	1937	74	8	Ch-Kw	60- 74	--	14	--	--	8-12-37	
6	National Pulverizing Co.	Adjacent to N. J. Silica Sand Co. no. 1	30	do.	1950	84	4	Ch-Kw	76- 84	20	24	4	5.0	8- 3-50	Used for sanitary facilities
7	Camp Cedar Knoll	0.3 mi east of Rt. 47 on south bank of Manantico Creek	30	do.	1932	80	6	Ch-Kw	77- 80	75	6	20	3.8	7- 6-32	
8	Richard Dunge	Rt. 47, 0.4 mi south of Manantico Creek	15	Rudy Skypala	1934	147	2	Ch-Kw	141- 147	6	5	--	--	6- 7-34	
9	F. Garrison	Rt. 47, 0.4 mi south of Manantico Creek	16	do.	1937	150	2	Ch-Kw	144- 150	30	10	5	6.0	11- 3-37	
10	Dusey-Del Canning Co.	Rt. 47, 1 mi south of Port Elizabeth	5	Gus Houser	1940	70	4	Ch-Kw	50- 70	150	4	--	--	11-26-34	Canning house well
11	Charles E. Sharp	East bank of Maurice River at Leesburg	8	Vance Skinner	1930	260	4	LKW	240- 260	150	2	18	8.3	9-20-30	Industrial well
12	N. J. State Prison Farm (No. 2)	Rt. 47, 2.0 mi southeast of Leesburg	15	J. J. Reilly	1937	303	10	LKW	267- 278	205	2	19	15	2-17-42	Standby and fire protection well
13	N. J. State Prison Farm (No. 1)	do.	15	do.	1937	280	10	LKW	264- 274	210	4	26	8.1	10-20-37	
14	Ben Thompson	Dorchester Rd., Heislerville	17	Vance Skinner	1930	276	4	LKW	260- 276	40	12	10	4.0	10-24-30	
15	American Clam Co.	East bank of the Maurice River, 2.2 mi west of Heislerville	5	A. C. Schultes	1949	268	6	LKW	240- 268	400	Flowing	--	--	10- 3-49	F. F. Fant, former owner, canning house well
16	American Clam Co. (No. 1)	do.	5	Vance Skinner	1939	270	6	LKW	245- 265	110	Flowing	3	37	9-23-39	do.
17	American Clam Co. (No. 2)	do.	5	do.	1963	270	8	LKW	250- 270	125	8	7	18	1-29-63	do.
18	Anna Kupeny	Moore's Beach Rd., 0.2 mi south of Delmont	8	do.	1930	296	4	LKW	288- 296	80	Flowing	16	5.0	11- 1-30	
19	Eugene Dore	East Point	10	do.	1941	270	3	LKW	262- 270	60	8	8	7.5	7-20-49	
20	East Point Water Assoc.	do.	5	Gus Houser	1938	266	4	LKW	242- 264	18	8	--	--	7- 7-38	Semipublic supply well
21	Thompsons Beach Civic Assoc.	Thompsons Beach	5	Vance Skinner	1947	310	4	LKW	290- 307	--	--	--	--	--	
22	Moores Beach Property Assoc.	Moores Beach	5	do.	1949	315	4	LKW	295- 315	200	Flowing	25	8.0	11-10-49	Semipublic supply well
23	Louis Tomlinson	do.	5	do.	1940	320	4	LKW	310- 320	70	Flowing	6	12	6-30-40	
MILLVILLE															
Ml- 1	April Bros.	N. J. Rt. 49, 1.6 mi south of Carmel	95	Haines & Moore	1942	86	8	Ch-Kw	66- 86	--	32	--	--	11- 4-42	
2	Bronislaw Hayda	N. J. Rt. 49, 3.7 mi west of Maurice River	95	Gus Houser	1930	106	4	Ch-Kw	93- 106	15	37	--	--	3- 1-30	
3	City of Millville (No. 14)	0.1 mi north of N. J. Rt. 49 and 2.7 mi west Maurice River	90	A. C. Schultes	1955	166	12	Ch-Kw	118- 149	700	50	30	23	12-30-61	Public supply well
4	H. Suszynski	Millville-Carmel Rd.	75	Gus Houser	1952	50	4	Ch-Kw	40- 54	10	30	6	1.6	8-25-52	
5	St. Peter & Paul Church	Reghin Rd. and 0.3 mi south of N. J. Rt. 49	82	do.	1955	81	4	Ch-Kw	71- 81	100	90	--	--	8-24-55	

TABLE 14.--RECORDS OF SELECTED WELLS IN CUMBERLAND COUNTY, N.J.--Continued

Aquifers: CM, Cape May Formation
CM-KW, Cape May or Kirkwood
Ch-KW, Cohansey-Kirkwood
LKW, Lower Kirkwood
PP, Piney Point
MW, Mount Laurel and Wenonah
ET, Englishtown

Well numbers are listed by political subdivision and correspond with well numbers in figure 3.

Well Number	Owner and Owner's Well Number	Location	Altitude of land surface (feet)	Drilling Contractor	Year Drilled	Total depth drilled (feet)	Diameter of casing (inches)	Aquifer	Screen setting (feet)	Well performance test: Yield (gpm)	Static water level (feet)	Drawdown (feet)	Specific capacity (gpm/ft of drawdown)	Date	Remarks
MILLVILLE--Continued															
Mi- 6	B. B. Whitaker	High and McNeal Sts.	65	Robbins & Sons	1931	120	8	Ch-Kw	100- 12[illegible]	375	22	41	9.1	3-15-31	Ice house
7	T. C. Wheaton Co.	N. 12th Street	40	A. G. Schultze	1946	150	--	Ch-Kw	--	275	--	--	--	--	
8	Do.	do.	45	Vance Skinner	1931	117	6	Ch-Kw	100- 11[illegible]	80	10	10	8.0	2- 3-31	Industrial well
9	West Co.	10th & G. Streets	45	do.	1932	129	6	Ch-Kw	129	--	5	--	--	1952	do
10	City of Millville (No. 12)	Wade Ave. well field	8	John B. Bulon	1949	125	10	Ch-Kw	91- 12[illegible]	800	4	46	17	11-14-49	Public supply well
11	City of Millville	do.	5	Layne-New York Co.	1963	316	6	Ch-Kw	160- 10[illegible]	170	+16	130	1.3	3-22-63	Flowing well Static level above land surface Layne test no. 1
12	Do.	do.	5	do.	1963	316	6	LKW	245- 29[illegible]	405	Flowing	133	3.0	3-16-63	do
13	City of Millville Wells 6 thru 11	do.	5	--	1925	120½	6 - 10	Ch-Kw	85- 10[illegible]	--	--	--	--	--	Public supply wells
14	Armstrong Cork Co. (No. 1)	East bank of Maurice River	10	Artesian Well Drilling Co.	1950	115	10	Ch-Kw	81- 11[illegible]	650	8	40	21	8- 3-50	Industrial wells
15	Armstrong Cork Co. (No. 2)	do.	20	do.	1950	165	10	Ch-Kw	100- 16[illegible]	550	17	30	18	8-11-50	do.
16	Armstrong Cork Co. (No. 3)	do.	22	do.	1950	140	10	Ch-Kw	105- 13[illegible]	610	20	30	16	8-25-50	do
17	Holly City Swim Club	Wade Blvd.	45	R. Shypola	1960	55	2	Ch-Kw	45- 5[illegible]	30	16	4	7.5	7- 6-60	
18	H. Salbur	Hogbin Rd.	95	Gus Hoover	1951	101	4	Ch-Kw	91- 9[illegible]	10	30	--	--	8-10-51	
19	Geo. F. Borcelow	Buckshutem & Hogbin Rd.	90	Haines & Moore	1953	57	4	Ch-Kw	50- 5[illegible]	20	30	4	5.0	4- 6-53	
20	City of Millville Airport Well No. 1	Municipal Airport	70	C. W. Lauman	1962	181	12	Ch-Kw	160- 18[illegible]	701	31	57	12	10-19-62	Public supply well
21	City of Millville Airport Well No. 2	Municipal Airport	70	C. W. Lauman	1962	173	12	Ch-Kw	149- 16[illegible]	190	32	10	19	10-23-62	Public supply well
22	City of Millville	do.	62	Layne- New York Co.	1963	370	8	LKW	335- 36[illegible]	310	27	69	4.5	7-16-63	Layne test no. 3
23	City of Millville Airport Well No. 3	do.	62	do.	1964	201	12	Ch-Kw	161- 19[illegible]	1,000	30	58	17	8- 5-64	Public supply well
24	City of Millville No. 13	Orange Street	22	John B. Bulon	1955	150	12	Ch-Kw	112- 14[illegible]	850	9	55	15	12-29-54	Well abandoned in 1958 "Too much iron." USGS observation well since 1962
25	City of Millville	do.	22	Layne-New York Co.	1963	330	8	LKW	320- 33[illegible]	307	7	18	17	6-25-63	Drillers log in table 16. Layne test no. 2
26	H. Kohnstamm Co.	Along Pa.-Reading Seashore RR, 0.4 mi NW of Manantico Creek	25	do.	1953	164	6	Ch-Kw	132- 16[illegible]	120	6	44	2.7	1953	Unused test well
27	B. A. Wick	N. J. Rt. 49, 2.0 mi west of Cumberland	50	Haines & Moore	1954	102	4	Ch-Kw	95- 10[illegible]	20	36	4	5.0	8-31-54	
28	N. J. Silica Sand Co.	0.8 mi south of N. J. Rt. 49 and 1.8 mi west of Cumberland	50	do.	1955	74	8	Ch-Kw	59- 7[illegible]	100	24	6	17	6-10-65	Sand washing well
29	Do.	do.	45	do.	1959	82	6	Ch-Kw	76- 8[illegible]	100	19	--	--	5-20-59	do
30	Do.	do.	45	do	1959	83	4	Ch-Kw	73- 8[illegible]	12	20			7- 2-59	"Holly House" well
31	Ed Trask	N. J. Rt. 47, 0.6 mi north of Manantico Creek	20	Rudy Shypola	1954	133	2	Ch-Kw	126- 13[illegible]	20	6	4	5.0	9-21-54	
32	H. Sanger	do.	20	do.	1954	135	2	Ch-Kw	129- 13[illegible]	10	8			3-17-54	

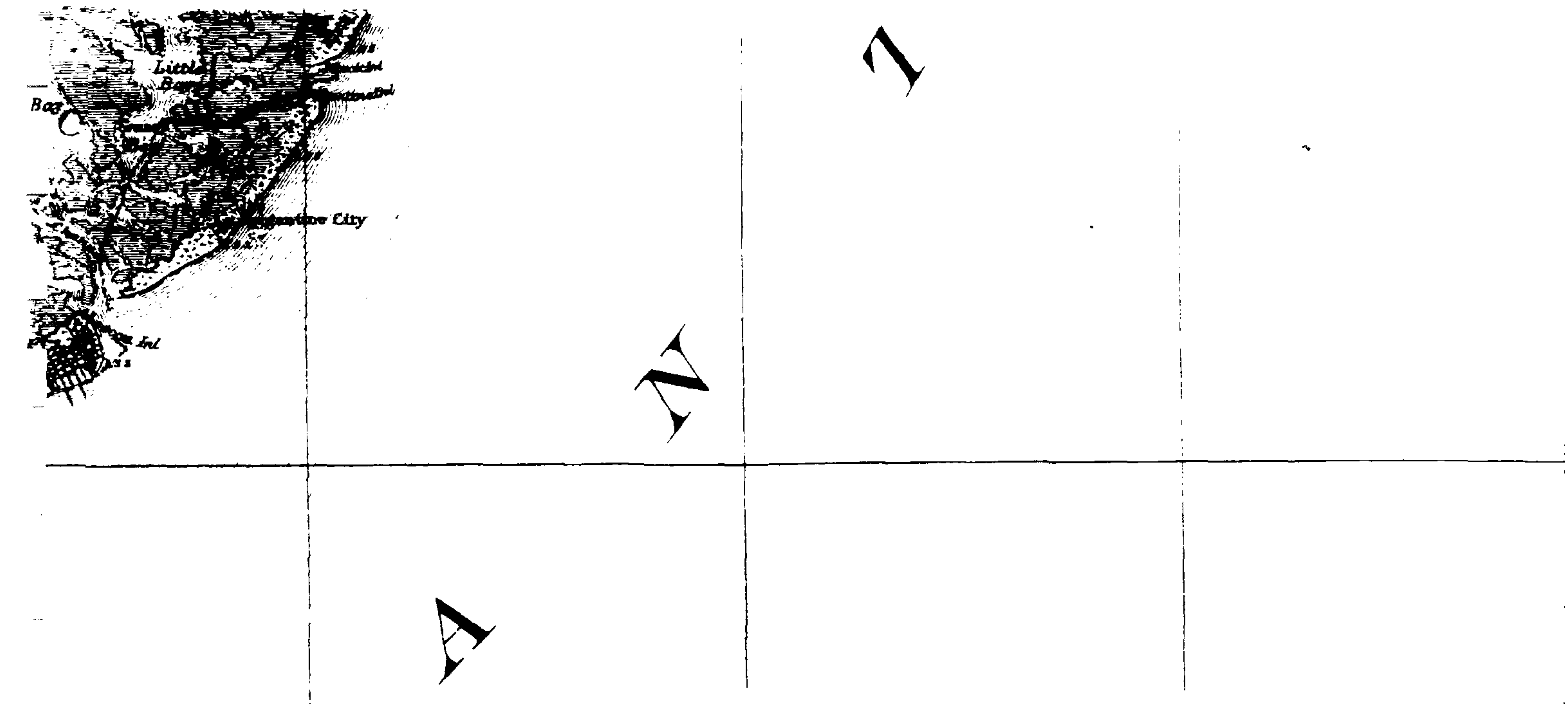
TABLE 16.--RECORDS OF SELECTED WELLS IN CUMBERLAND COUNTY, N.J.--Continued

Aquifer: CM, Cape May Formation
CM-KW, Cape May or Kirkwood
Ch-KW, Cohansey-Kirkwood
LKW, Lower Kirkwood
PP, Piney Point
MW, Mount Laurel and Wenonah
ET, Englishtown

Well numbers are listed by political subdivision and correspond with well numbers in figure 2

Well Number	Owner and Owner's Well Number	Location	Altitude of land surface (feet)	Drilling Contractor	Year Drilled	Total depth drilled (feet)	Diameter of casing (inches)	Aquifer	Screen setting (feet)	Well performance test: Yield (gpm)	Static water level (feet)	Drawdown (feet)	Specific capacity (gpm/ft of drawdown)	Date	Remarks
MILLVILLE--Continued															
Ml-33	R. Burcham	N. J. Rt. 47 at Manantico Creek	20	Holmes & Moore	1953	76	6	CM	67- 73	30	11	6	5.0	9-28-53	
34	B. Martin	Laurel Lake	25	Vance Skinner	1952	98	3	Ch-Kw	93- 98	10	20	--	-	11-27-52	
SHILOH															
Sh- 1	Florence Bowden	Rt. 77, Shiloh	110	Holmes & Moore	1958	75	6	Ch-Kw	69- 74	15	30	5	3.0	11- 4-58	
STOW CREEK TOWNSHIP															
Sc- 1	Kenneth B. Roberts	0.6 mi south of Cohansey	125	Holmes & Moore	1955	90	4	Ch-Kw	50- 56	20	35	5	4	4-25-55	
2	Percy Fogg (USGS West Branch No. 15)	Cohansey Rd. 3.3 mi north of Shiloh	105	--	--	25	36	Ch-Kw	--	--	19	--	--	2-16-56 to 5-23-60	USGS water level observation well. Static level is the average for a 5 year period
3	Rollo Davis	0.3 mi west of Cohansey Rd. and 1.9 mi north of Shiloh	125	Holmes & Moore	1961	110	6	Ch-Kw	52- 67	60	43	15	4.0	4- 3-61	
4	U.S. Geological Survey (West Branch No. 14)	0.1 mi west of Cohansey Rd. and 1.9 mi north of Shiloh	125	--	1953	58	1¼	Ch-Kw	50- 58	--	41	--	--	1-16-56 5-23-60	USGS water level observation well. Static level is the average for a 5 year period
5	Frank W. Irelan	Rt. 49, 1.9 mi NW of Shiloh	100	Holmes & Moore	1958	58	4	Ch-Kw	52- 57	20	30	5	4	5- 2-58	
6	David B. Davis	0.8 mi NW of Shiloh	120	do.	1958	75	4	Ch-Kw	70- 75	--	41	5-	--	4- -58	
7	F. B. Horner	Horner Corner, 1.1 mi NW of Roadstown	125	do.	1956	77	4	Ch-Kw	70- 76	12	51	19	0.6	5-22-56	
8	Norman Evans	do.	130	do.	1953	87	4	Ch-Kw	79- 85	7	60	--	--	1-11-53	
9	Leslie G. Fogg	Garrison Corner, 2.0 mi SE of Canton	35	do.	1961	175	4	PP	open hole 147- 175	22	27	100	0.2	12- 5-61	
10	Charles G. Sheppard	Gum Tree Corner, 2.6 mi NE of Canton	45	do.	1957	170	4	PP	open hole 155- 170	8	27	40	0.2	10- 8-57	
11	Morris B. Horner	0.7 mi west of Roadstown and 2.0 mi SW of Shiloh	120	do.	1960	101	4	Ch-Kw	90- 100	24	49	8	3.0	4- 4-60	
12	W. Harper Ewing	1.0 mi west of Roadstown	120	do.	1958	73	4	Ch-Kw	66- 72	18	52	6	3.0	8- 8-58	
UPPER DEERFIELD TOWNSHIP															
UD- 1	Seabrook Farms Co.	Griese Lane	130	Delmarva Drilling Co.	1964	106	12	Ch-Kw	46- 106	1,150	30	26	44	3-19-64	Concrete irrigation well
2	Seabrook Farms Co.	1.0 mi NE of Rt. 77 on Polk Rd.	118	Vance Skinner	1956	164	10	Ch-Kw	126- 161	1,000	26	--	--	7-26-56	Research farm irrigation well
3	Francis Lentine	Pindale Dr., 0.2 mi east of Bridgeton-Centerton Rd.	110	Gus Hauser	1952	38	4	Ch-Kw	28- 34	15	17	4	3.0	9-12-52	
4	Alfred A. Kuehn	Deerfield-Seeley Rd.	90	Holmes & Moore	1953	55	4	Ch-Kw	48- 54	10	31	13		12- 7-53	
5	George Weist	do.	85	do.	1951	64	4	Ch-Kw	58- 64	20	39	10	2	10-12-51	
6	Seabrook Farms No. 1	Seabrook	--	Wm. Stothoff Co.	1934	91	8	Ch-Kw	61- 91	420	37	-	-	5-11-37	Industrial wells
7	Do. No. 30	do.	--	Ray Simpkins	1963	185	12	Ch-Kw	155- 185	740	37			-	do.
8	Do. No. 6	do.	102	--	1937	160	10	Ch-Kw	110- 160	770	56	16	48	6-29-37	do.

REFERENCE NO. 9



GEOLOGIC MAP

OF

NEW JERSEY

Compiled from published folios and from manuscript data in possession of the Survey, the latter chiefly the field work of

W. S. BAYLEY, (Pre-Cambrian)
H. B. KÜMMEL, (Paleozoic, Triassic, Quaternary)
R. D. SALISBURY, (Quaternary)
G. N. KNAPP, (Cretaceous, Tertiary, Quaternary)

BY

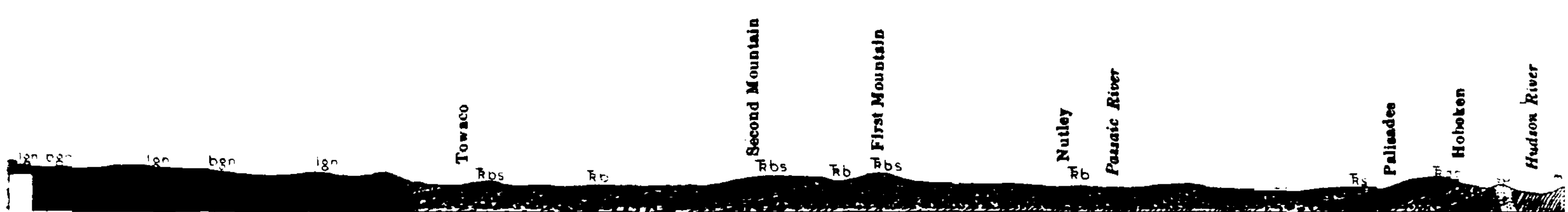
J. VOLNEY LEWIS AND HENRY B. KÜMMEL

1910-1912

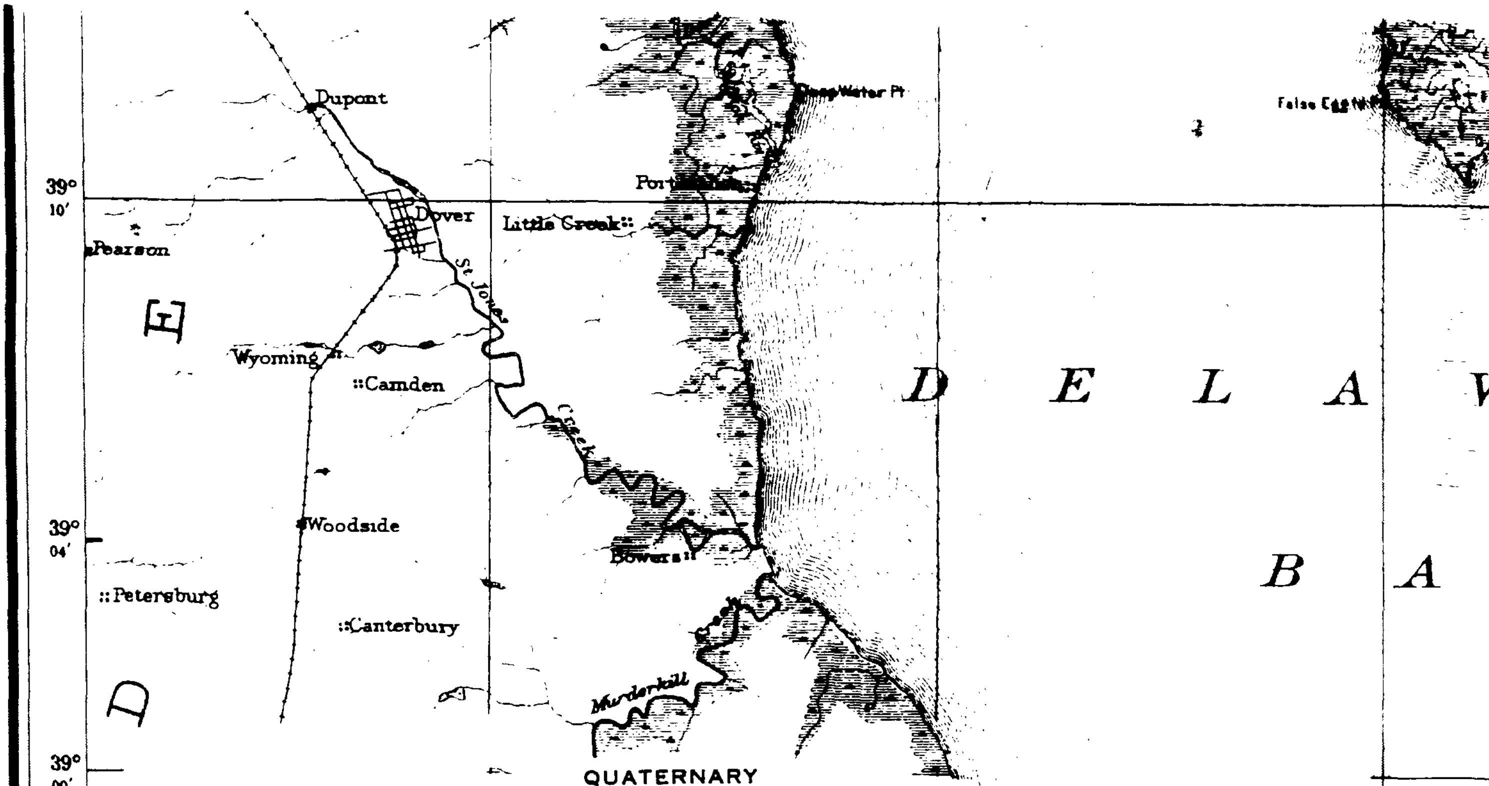
REVISED BY H. B. KÜMMEL, 1931
AND MEREDITH E. JOHNSON, 1950

SCALE: 1:250,000 (approximately 4 miles to an inch)

4 3 2 1 0 4 8 12 Miles



ken. Scales: Horizontal, $\frac{1}{250000}$; Vertical, $\frac{1}{100000}$; Vertical exaggeration 2½.



QUATERNARY

Surface covering of variable thickness, generally unconsolidated.

GLACIAL

NOTE.—A sheet of stony or sandy clay of variable thickness (till, unstratified drift, or boulder clay) covers much of the surface north of the terminal moraine, but is not represented on the map.

Terminal Moraines of the last (Wisconsin) glacial epoch
A belt of irregular hummocky accumulations of clay, sand, gravel, and boulders, in confused mixture.

Recessional Moraine (Wisconsin)
Smaller morainic accumulations north of the terminal moraine, including some stratified drift of kame-like habit, and marking pauses in the recession of the last ice sheet.

Qsd — **Stratified Drift (Wisconsin)**
Sand and gravel plains, deltas, eskers, kames, and terraces, chiefly north of the terminal moraine and in the valleys leading south from it. Also includes sand, gravel, and clay deposits of the extinct Lake Passaic.

Shore Line of Lake Passaic (Wisconsin)
Broken line indicates approximate location.

Early Drift
Remnants of glacial drift, both stratified and unstratified, much older than the Wisconsin, south of the terminal moraine.

NONGLACIAL

NOTE.—Washed or wind-blown sand and gravel (unclassified and not shown on the map) cover the surface at many places in the Coastal Plain.

Qbs — **Beach Sand and Gravel**
Including dunes and dune sand along the coast. Not everywhere sharply distinguished from Cape May formation.

(UNCONFORMITY)

Qcm — **Cape May Formation (Sangamon epoch and later)**
Low terraces and plains of gravel and sand, with some clay. Merges into stratified drift in Delaware and Raritan valleys.

(UNCONFORMITY)

Qrd — **River Drift**
Higher terraces of the upper Raritan valley.

(UNCONFORMITY)

Qps — **Pensauken Formation (Interglacial and early glacial age)**
Gravel and sand on higher terraces, capping hills and divides, and covering some plains.

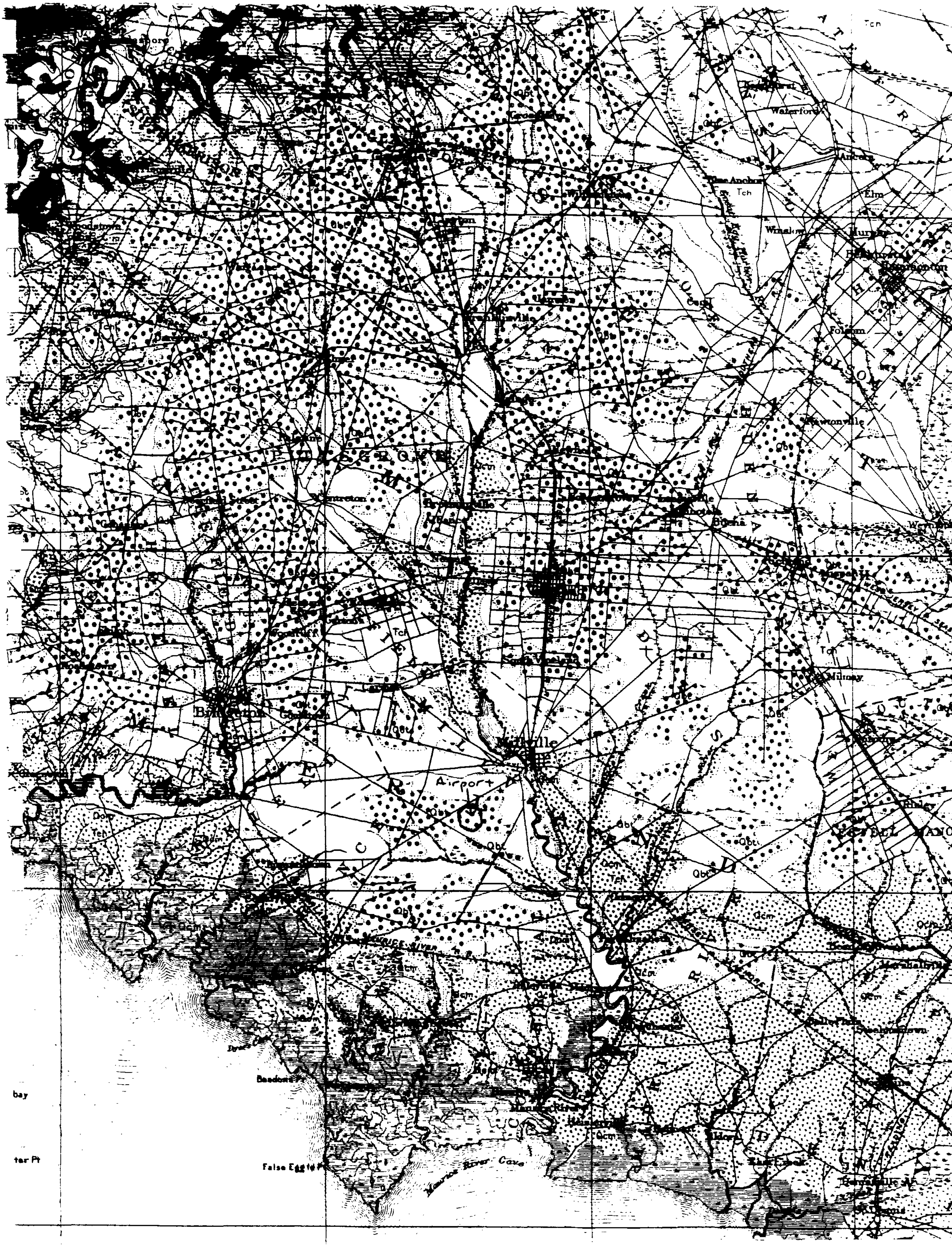
(UNCONFORMITY)

Qbt — **Bridgeton Formation (Probably earliest glacial and interglacial age)**
Gravel and sand, in part solidified by iron oxide, capping higher hills and divides along the southeast side of the Amboy-Trenton and Delaware valleys.

(UNCONFORMITY)

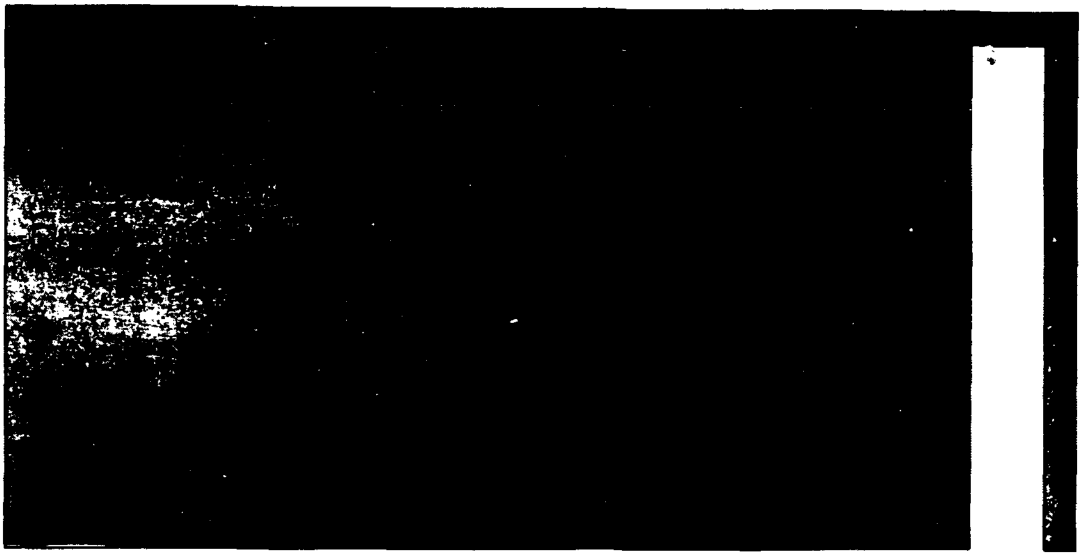
Section C-C.—Phillipsburg to Bordentown. Scales: Horizontal, $\frac{1}{250000}$; Ve

38° 50′ 38° 40′ 75°30′ 75°20′ 75°12′ 75°10′



Tch
Waterford
Elm
Winslow
Hammonton
Folsom
Newtonville
Buena
Centreton
South Vineland
Milmay
Millville
Airport
Bridgeton
Qbt
Qcm
Maurice River Cove
False Egg Is Pt
bay
ter Pt

REFERENCE NO. 10



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GROUNDWATER

Prentice-Hall, Inc.
Englewood Cliffs, New Jersey 07632

Table 2.2 Range of Values of Hydraulic Conductivity and Permeability

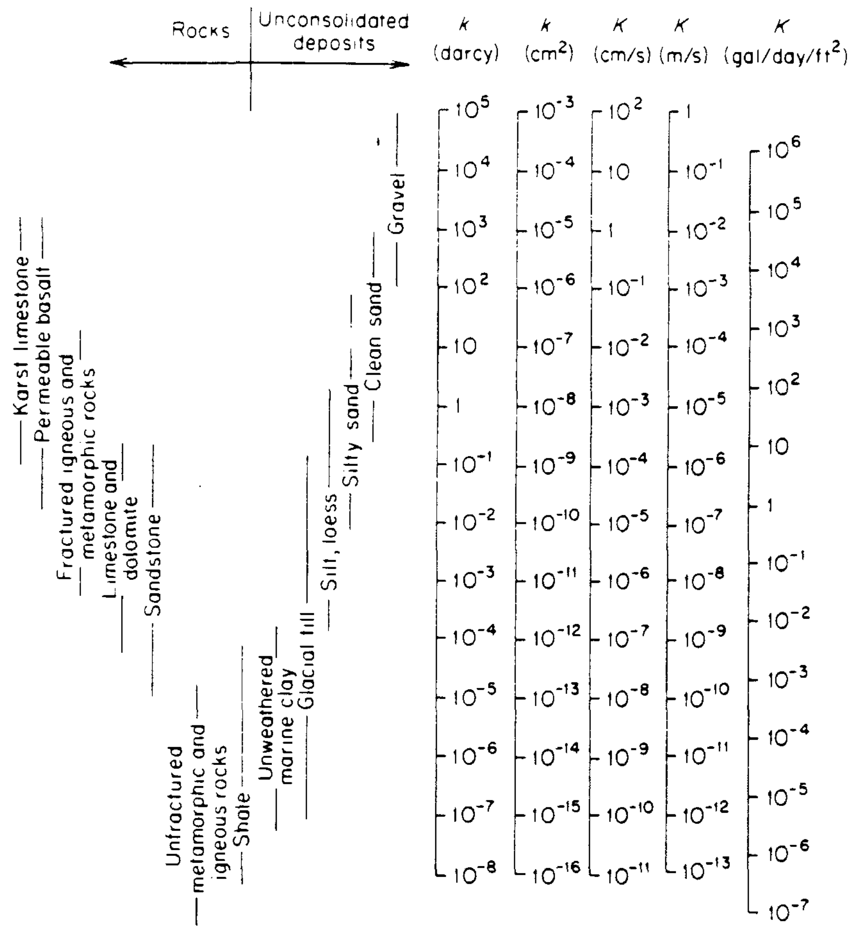


Table 2.3 Conversion Factors for Permeability and Hydraulic Conductivity Units

	Permeability, k*			Hydraulic conductivity, K		
	cm^2	ft^2	darcy	m/s	ft/s	U.S. gal/day/ft^2
cm^2	1	1.08×10^{-3}	1.01×10^{8}	9.80×10^{2}	3.22×10^{3}	1.85×10^{9}
ft^2	9.29×10^{2}	1	9.42×10^{10}	9.11×10^{5}	2.99×10^{6}	1.71×10^{12}
darcy	9.87×10^{-9}	1.06×10^{-11}	1	9.66×10^{-6}	3.17×10^{-5}	1.82×10^{1}
m/s	1.02×10^{-3}	1.10×10^{-6}	1.04×10^{5}	1	3.28	2.12×10^{6}
ft/s	3.11×10^{-4}	3.35×10^{-7}	3.15×10^{4}	3.05×10^{-1}	1	6.46×10^{5}
U.S. gal/day/ft^2	5.42×10^{-10}	5.83×10^{-13}	5.49×10^{-2}	4.72×10^{-7}	1.55×10^{-6}	1

*To obtain k in ft^2, multiply k in cm^2 by 1.08×10^{-3}.

REFERENCE NO. 11

SUBJECT TO REVISION

WATER WITHDRAWAL POINTS AND NJGS CASE INDEX SITES WITHIN 5.0 MILES OF:

LATITUDE 392229
LONGITUDE 750423

DRAFT

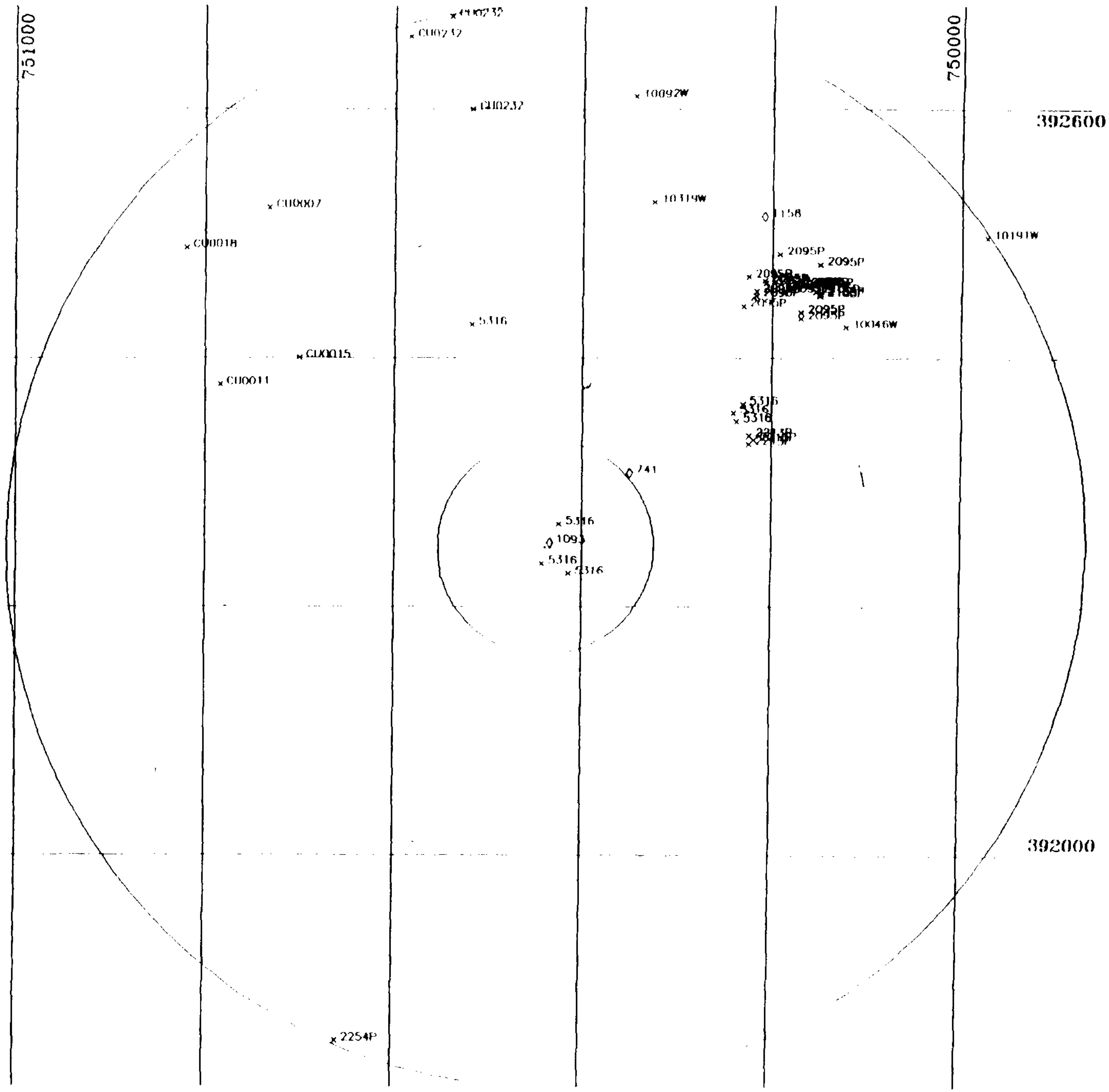
SCALE: 1:63,360
(1 Inch = 1 Mile)

× WATER WITHDRAWAL POINTS
◊ NJGS CASE INDEX SITES
1 MILE AND 5 MILE RADII INDICATED

NJGS CASE INDEX DATA RETRIEVED FROM
NEW JERSEY GEOLOGICAL SURVEY
ON 12/22/87

PLOT PRODUCED BY
NJDEP
DIVISION OF WATER RESOURCES
BUREAU OF WATER ALLOCATION
CN 029
TRENTON, NJ 08625

DATE: 08/13/88



SUBJECT TO REVISION

Page 1 of NJBS CASE INDEX SITES WITHIN 5.0 MILES OF 392229 LAT. 750423 LON. AS OF 12/22/87 (IN ORDER BY SITE NUMBER) - 08/13/88

SITENUM	NAME	LAT	LON	DISTANCE	CONTAM	FMCODE1	FMCODE2	STATUS1	STATUS2
741	MILLVILLE CITY LANDFILL, MILLVILLE, CUMBERLAND CO.	392305	750330	1.0	59	1025	0	9	
1093	AIRWORK CORP., MILLVILLE, CUMBERLAND CO.	392231	750420	0.1	68	0150	1025	1	8
1158	CONRAIL FACILITY, END OF LADOW AVE. MILLVILLE CITY, CUMBERLAND CO.	392508	750205	3.6	53			3	

Number of Observations: 3

Page 1 of PRELIMINARY SURVEY OF WATER WITHDRAWAL POINTS WITHIN 5.0 MILES OF 392229 LAT. 750423 LON. (IN ORDER BY PERMIT NUMBER) - 08/13/88

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	PLACE	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
10004W	MILLVILLE BOARD OF EDUCATION	3500932	1	392415	750114	F	3.4	11	10	142	GTCH		250
10092W	CUMBERLAND COUNTY COLLEGE	3501000	1	392606	750327	T	4.2	11	10	153	GTCH		180
10191W	FAIRVIEW MANOR PARK, INC.	3403453	2	392458	745944	F	5.0	11	14		GTCH		
10319W	COUNTRY MEADOWS MOBILE HOME PK	3506614	1	392515	750315	T	3.3	11	10	100	GTCH		
2095P	WHEATON GLASS COMPANY	5500050	1	392425	750218		2.9	11	10	132	GTCH		150
	WHEATON GLASS COMPANY	5500051	2	392430	750210		3.0	11	10	34	GTCH		7
	WHEATON GLASS COMPANY	5500052	3	392432	750210		3.0	11	10	34	GTCH		7
	WHEATON GLASS COMPANY	5500053	4	392435	750140		3.4	11	10	42	GTCH		7
	WHEATON GLASS COMPANY	3500733	5	392435	750137		3.4	11	10	70	GTCH		100
	WHEATON GLASS COMPANY	5500054	6	392445	750130		3.6	11	10	70	GTCH		110
	WHEATON GLASS COMPANY	3500977	7A	392434	750148		3.3	11	10	120	GTCH		100
	WHEATON GLASS COMPANY	3500734	8	392419	750142		3.2	11	10	90	GTCH		90
	WHEATON GLASS COMPANY	3500909	9	392432	750152		3.2	11	10	130	GTCH		
	WHEATON GLASS COMPANY	3500922	10	392422	750142		3.2	11	10	140	GTCH		190
	WHEATON GLASS COMPANY	3500969	11	392435	750145		3.3	11	10	150	GTCH		500
	WHEATON GLASS COMPANY	3500996	12	392439	750215		3.1	11	10	150	GTCH		400
	WHEATON GLASS COMPANY	3501155	13	392437	750205		3.2	11	10	146	GTCH		500
	WHEATON GLASS COMPANY	3501156	14	392436	750204		3.2	11	10	146	GTCH		500
	WHEATON GLASS COMPANY	3501418	15	392450	750155		3.5	11	10	130	GTCH		65
2153P	THE WEST COMPANY	5500010	2	392430	750130	F	3.4	11	10	130	GTCH		250
	THE WEST COMPANY	3500973	3	392431	750130	S	3.4	11	10	145	GTCH		450
	THE WEST COMPANY	3500986	4	392432	750133	S	3.4	11	10	147	GTCH		1100
2217P	NATIONAL CAN CORPORPORATION	3500718	1	392319	750214		2.1	11	10	115	GTCH		400
	NATIONAL CAN CORPORPORATION	3500719	2	392323	750214		2.1	11	10	108	GTCH		400
	NATIONAL CAN CORPORPORATION	3500720	3	392321	750211		2.2	11	10	140	GTCH		500
2354P	U.S. SILICA COMPANY	POND 16	WHITAKER	391830	750635		5.0	11	04	15	GTCH		
5316	MILLVILLE CITY	5500056	AIRPORT #1	392221	750425	S	0.2	11	10	181	GTCH		700
	MILLVILLE CITY	5500057	AIRPORT #2	392216	750408		0.3	11	10	147	GTCH		700
	MILLVILLE CITY	3500862	AIRPORT #3	392240	750414	S	0.2	11	10	161	GTCH		1000
	MILLVILLE CITY	3500548	B. PIKE	392416	750510	S	2.2	11	10	118	GTCH		700
	MILLVILLE CITY	5500058	WAKE #13	392334	750224	S	2.1	11	10	260	GTCH		800
	MILLVILLE CITY	3500924	WAKE #14	392330	750222	S	2.1	11	10	120	GTCH		600
	MILLVILLE CITY	3500953	WAKE #15	392338	750218	S	2.3	11	10	131	GTCH		1000
	MILLVILLE CITY	3502522	WAKE #16	392338	750218	S	2.3	11	10	86	GTCH		800
CU0007	AURA ORCHARDS	WELL 1		392512	750719	U	4.0	11			GTCH		
CU0011	LANDHOLDERS, INC.	WELL 1		392347	750750	U	3.4	11			GTCH		
CU0015	COOPER, STEPHEN	WELL 1		392400	750700	U	2.9	11			GTCH		
CU0018	RUSKE, ROGER & MARGARET	WELL 1		392453	750812	U	4.3	11			GTCH		
CU0232	LANDIS SEWERAGE AUTHORITY		PROPOSED	392600	750510	U	4.1	11	03				750
	LANDIS SEWERAGE AUTHORITY		PROPOSED	392645	750524	U	5.0	11	03	110			630
	LANDIS SEWERAGE AUTHORITY		PROPOSED	392635	750550	U	4.9	11	03	110			590

Number of Observations: 41

NUMBER	NAME	SOURCEID	LOCID	LAT	LON	LLACC	DISTANCE	COUNTY	MUN	DEPTH	GEO1	GEO2	CAPACITY
010018	RUSLE, ROGER & MARGARET	WELL 1		392453	750812	U	4.3	11			GTCH		
010011	LANDHOLDERS, INC.	WELL 1		392347	750750	U	3.4	11			GTCH		
010007	AURA ORCHARDS	WELL 1		392512	750719	U	4.0	11			GTCH		
010015	COOPER, STEPHEN	WELL 1		392400	750700	U	2.9	11			GTCH		
[illegible]	U.S. SILICA COMPANY	POND 16	WHITAKER	391830	750635		5.0	11	04	15	GTCH		
010232	LANDIS SEWERAGE AUTHORITY		PROPOSED	392635	750550	U	4.9	11	03	110			590
0102[illegible]	LANDIS SEWERAGE AUTHORITY		PROPOSED	392645	750524	U	5.0	11	03	110			630
5316	MILLVILLE CITY	3500548	B. PIKE	392416	750510	S	2.2	11	10	118	GTCH		700
0102[illegible]	LANDIS SEWERAGE AUTHORITY		PROPOSED	392600	750510	U	4.1	11	03				750
5316	MILLVILLE CITY	5500056	AIRPORT #1	392221	750425	S	0.2	11	10	181	GTCH		700
5316	MILLVILLE CITY	5500062	AIRPORT #3	392240	750414	S	0.2	11	10	161	GTCH		1000
5316	MILLVILLE CITY	5500057	AIRPORT #2	392216	750408		0.3	11	10	147	GTCH		700
10092W	CUMBERLAND COUNTY COLLEGE	3501000	1	392606	750327	T	4.2	11	10	153	GTCH		180
10319W	COUNTRY MEADOWS MOBILE HOME PK	3506614	1	392515	750315	T	3.3	11	10	100	GTCH		
5316	MILLVILLE CITY	5500058	WARE #13	392334	750224	S	2.1	11	10	260	GTCH		800
5316	MILLVILLE CITY	3500924	WARE #14	392330	750222	S	2.1	11	10	120	GTCH		600
2095P	WHEATON GLASS COMPANY	5500050	1	392425	750218		2.9	11	10	132	GTCH		150
5316	MILLVILLE CITY	3500953	WARE #15	392338	750218	S	2.3	11	10	131	GTCH		1000
5316	MILLVILLE CITY	3502522	WARE #16	392338	750218	S	2.3	11	10	86	GTCH		800
2095P	WHEATON GLASS COMPANY	3500996	12	392439	750215		3.1	11	10	150	GTCH		400
2213P	NATIONAL CAN CORPORPORATION	3500718	1	392319	750214		2.1	11	10	115	GTCH		400
2213P	NATIONAL CAN CORPORPORATION	3500719	2	392323	750214		2.1	11	10	108	GTCH		400
2213P	NATIONAL CAN CORPORPORATION	3500720	3	392321	750211		2.2	11	10	140	GTCH		500
2095P	WHEATON GLASS COMPANY	5500051	2	392430	750210		3.0	11	10	34	GTCH		7
2095P	WHEATON GLASS COMPANY	5500052	3	392432	750210		3.0	11	10	34	GTCH		7
2095P	WHEATON GLASS COMPANY	3501155	13	392437	750205		3.2	11	10	146	GTCH		500
2095P	WHEATON GLASS COMPANY	3501156	14	392436	750204		3.2	11	10	146	GTCH		500
2095P	WHEATON GLASS COMPANY	3501418	15	392450	750155		3.5	11	10	130	GTCH		65
2095P	WHEATON GLASS COMPANY	3500909	9	392432	750152		3.2	11	10	130	GTCH		
2095P	WHEATON GLASS COMPANY	3500977	7A	392434	750148		3.3	11	10	120	GTCH		100
2095P	WHEATON GLASS COMPANY	3500969	11	392435	750145		3.3	11	10	150	GTCH		500
2095P	WHEATON GLASS COMPANY	3500734	8	392419	750142		3.2	11	10	90	GTCH		90
2095P	WHEATON GLASS COMPANY	3500922	10	392422	750142		3.2	11	10	140	GTCH		190
2095P	WHEATON GLASS COMPANY	5500053	4	392435	750140		3.4	11	10	42	GTCH		7
2095P	WHEATON GLASS COMPANY	3500733	5	392435	750137		3.4	11	10	70	GTCH		100
2155P	THE WEST COMPANY	3500986	4	392432	750133	S	3.4	11	10	147	GTCH		1100
2095P	WHEATON GLASS COMPANY	5500054	6	392445	750130		3.6	11	10	70	GTCH		110
2155P	THE WEST COMPANY	5500010	2	392430	750130	F	3.4	11	10	130	GTCH		250
2155P	THE WEST COMPANY	3500973	3	392431	750130	S	3.4	11	10	145	GTCH		450
10046W	MILLVILLE BOARD OF EDUCATION	3500932	1	392415	750114	F	3.4	11	10	142	GTCH		250
10191W	FAIRVIEW MANOR FARM, INC.	3503453	2	392458	745944	F	5.0	11	14		GTCH		

Number of Observations: 41

Page 1 of [illegible] SITES WITHIN 5.0 MILES OF [illegible] LAT. [illegible] LON. [illegible] (IN ORDER BY DECREASING LONGITUDE) [illegible]

STATION	NAME	LAT	LON	DISTANCE	CONTACT	ENCODE1	ENCODE2	STATUS1	STATUS2
[illegible]	[illegible], CUMBERLAND CO.	[illegible]	[illegible]	0.1	48	0100	[illegible]	1	1
[illegible]	[illegible], CUMBERLAND CO.	[illegible]	[illegible]	1.0	57	[illegible]	0	2	
[illegible]	[illegible], CUMBERLAND CO.	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	

Number of [illegible]: [illegible]

DESCRIPTION OF WATER WITHDRAWAL POINTS

The Water Withdrawal Points listing contains the following fields:

CAPACITY: the pump capacity in gallons per minute
COUNTY: county the withdrawal point is in
DEPTH: depth of the well or pond
DISTANCE: distance in miles from center of circle
GEO1: the ground or surface water source
GEO2: a secondary source of the water
LAT: latitude of the withdrawal point
LLACC: accuracy of the latitude and longitude estimates
LOCID: the local identification of the withdrawal point, or a continuation of the SOURCEID field for surface water
LON: longitude of the withdrawal point
MUN: the municipality the withdrawal point is in
NAME: name of the permit, certificate, or registration holder
NUMBER: Water Allocation permit, Agricultural Certification, or Registration number
SOURCEID: the well permit number or other identifier for the water withdrawal

The listing that you have requested includes most wells and surface intakes that are in the Water Allocation Permits, and representative sources from most of the Agricultural Certificates. Recognizing the fact that the list will contain errors and omissions, it is advisable to use this resource as a guide and to verify all data. We try to maintain an accurate database; however, we can not yet guarantee reliability. If you spot any errors we would be very grateful to hear about them. Please call or write to us in reference to the "Radius Program" at:

NJDEP
Division of Water Resources
Bureau of Water Allocation
CN-029
Trenton, NJ 08625

(609) 292-2957

Thank you.

Please see the attached sheets for definitions of the codes used in the Water Withdrawal Points listing.

CODES USED IN THE WATER WITHDRAWAL POINTS LISTING

This packet contains information on the database codes that the Bureau of Water Allocation uses in the Water Withdrawal Points Listing.

COUNTY:

01 - Atlantic	15 - Gloucester	29 - Ocean
03 - Bergen	17 - Hudson	31 - Passaic
05 - Burlington	19 - Hunterdon	33 - Salem
07 - Camden	21 - Mercer	35 - Somerset
09 - Cape May	23 - Middlesex	37 - Sussex
11 - Cumberland	25 - Monmouth	39 - Union
13 - Essex	27 - Morris	41 - Warren

GEO:

RECENT	
Surficial Deposits	GRS
PLEISTOCENE	
Glacial Undifferentiated	GQGU
Stratified Drift	GQSD
Terminal Moraine	GQTM
Bridgeton	GQBS
Cape May	GQCM
Holly Beach Mbr.	GQCHB
Estuarine Sand	GQES
Pennsauken	GQPS
TERTIARY	
Beacon Hill	GTBH
Cohansey	GTCH
Cohansey & Kirkwood	GTCK
Kirkwood	GTKW
Upper	GTKWU
Rio Grande	GTKRG
Lower	GTKWL
Piney Point Mbr.	GTKPP
Shark River Marl	GTSR
Manasquan Marl	GTMQ
Vincentown Sand	GTVT
Hornerstown Marl	GTHT
CRETACEOUS	
Red Bank	GKRB
Navesink	GKNS
Mount Laurel	GKML
Wenonah	GKWE
Mount Laurel & Wenonah	GKMW
Marshalltown	GKMT
Englishtown	GKET
Woodbury	GKWB
Merchantville	GKMV
Magothy	GKM

Old Bridge	GKROB
Raritan	GKR
Sayreville Sand	GKRSS
Farrington	GKRF
Raritan/Magothy	GKMR
Potomac	GKP
TRIASSIC	
Brunswick Formation	GTRB
Lockatong Formation	GTRL
Stockton Formation	GTRS
Basalt	GTRBS
Diabase	GTRDB
Conglomerate	GTRCG
DEVONIAN	
Undifferentiated	GD
SILURIAN	
Bossardville Limestone	GSBD
Decker Formation	GSDK
Longwood Shale	GSLS
Poxono Island Fm	GSPI
Greenpond Conglomerate	GSGP
High Falls	GSHF
Shawangunk Fm	GSSG
ORDOVICIAN	
Martinsburg Fm	GOMB
Jacksonburg Fm	GOJB
Kittatinny Group	GOK
Outleaunee Fm	GOKO
Harmonyvale Mbr	GOKOH
Beaver Run Mbr	GOKOB
Epler	GOKE
Rickenbach	GOKR
CAMBRO ORDOVICIAN	
Kittatinny Fm	GCOK
CAMBRIAN	
Hardyston Quartzite	GCH
Allentown Fm	GCKA
Upper Mbr	GCKU
Limeport Mbr	GCKLP
Leithsville Fm	GCKL
Walkill Mbr	GCKLW
Hamburg Mbr	GCKLH
Califon Mbr	GCKLC
PRECAMBRIAN	
Granite	GPCGR
Gneiss	GPCGN
Undifferentiated	GPC

Franklin Lms	GPCFL
DELAWARE RIVER BASIN	
Unknown or Non-Specific	SD
Alloways Creek	SDALL
Alexsocken Creek	SDALE
Assiscunk Creek	SDASC
Assunpink Creek	SDASP
Big Timber Creek	SDBIG
Blacks Creek	SDBLA
Cooper's Creek	SDCOO
Crafts Creek	SDCRA
Crosswicks Creek	SDCRO
Delaware River	SDDEL
Flat Brook	SDFLA
Hakihokake Creek	SDHAK
Harihokake Creek	SDHAR
Jacob's Creek	SDJAC
Lockatong Creek	SDLOC
Lopatcong Creek	SDLOP
Mantua Creek	SDMNT
Musconetcong River	SDMUS
Nichisakawick Creek	SDNIC
Old Man's Creek	SDOLD
Paulins Kill	SDPAU
Pennsauken Creek	SDPEN
Pequest River	SDPST
Pohatcong Creek	SDPOH
Raccoon Creek	SDRAC
Rancocas Creek	SDRAN
Salem River	SDSAL
Wickecheoke Creek	SDWIC
RARITAN RIVER BASIN	
Unknown or Non-Specific	SR
Lawrence Brook	SRLAW
Lower Raritan	SRLOW
Millstone River	SRMIL
North Branch Raritan	SRNBR
South Branch Raritan	SRSBR
South River	SRSRV
PASSAIC RIVER BASIN	
Unknown or Non-Specific	SP
Canoe Brook	SPCAN
Lower Mid-Passaic River	SPLMP
Lower Passaic	SPLOW
Passaic River	SPPAS
Peckman River	SPPEC
Pequannock River	SPPNK
Pompton River	SPPOM
Ramapo River	SPRAM
Rockaway River	SPROC
Saddle River	SPSAD

Upper Mid-Passaic River	SPUMP
Upper Passaic River	SPUPP
Wanaque River	SPWAN
Whippany River	SPWHI
ATLANTIC COASTAL BASIN	
Unknown or Non-Specific	SC
Atlantic County Coastal	SCATL
Cape May County Coastal	SCCAP
Cedar Creek	SCCED
Great Egg Harbor River	SCGRE
Manasquan River	SCMSQ
Metedeconk River	SCMET
Monmouth County Coastal	SCMON
Mullica River	SCMUL
Navesink River	SCNAV
Ocean County Coastal	SCOCE
Raritan Bay	SCRAR
Shark River	SCSHA
Shrewsbury River	SCSHR
Toms River	SCTOM
Tuckahoe River	SCTUC
HUDSON RIVER BASIN	
Unknown or Non-Specific	SH
Hudson River	SHHUD
Papakating Creek	SHPAP
Pochuck Creek	SHPOC
Wallkill River	SHWAL
HACKENSACK RIVER BASIN	
Unknown or Non-Specific	SK
Hackensack River	SKHAC
RAHWAY RIVER BASIN	
Unknown or Non-Specific	SY
Rahway River	SYRAH
ELIZABETH RIVER BASIN	
Unknown or Non-Specific	SE
Elizabeth River	SEELI
DELAWARE BAY BASIN	
Unknown or Non-Specific	SB
Cohansey River	SBCOH
Maurice River	SBMAU
Stow Creek	SBSTO

LLACC:

S - accurate to +- 1 second
F - accurate to +- 5 seconds
T - accurate to +- 10 seconds
M - accurate to +- 1 minute
U - accuracy unknown

MUN: ATLANTIC COUNTY (01)

01 - Absecon City	02 - Atlantic City
03 - Brigantine City	04 - Buena Boro
05 - Buena Vista Twp	06 - Corbin City
07 - Egg Harbor City	08 - Egg Harbor Twp
09 - Estell Manor City	10 - Folsom Boro
11 - Galloway Twp	12 - Hamilton Twp
13 - Hammonton Town	14 - Linwood City
15 - Longport Boro	16 - Margate City
17 - Mullica Twp	18 - Northfield City
19 - Pleasantville City	20 - Port Republic City
21 - Somers Point City	22 - Ventnor City
23 - Weymouth Twp	

BERGEN COUNTY (03)

01 - Allendale Boro	02 - Alpine Boro
03 - Bergenfield Boro	04 - Bogota Boro
05 - Carlstadt Boro	06 - Cliffside Park Boro
07 - Closter Boro	08 - Cresskill Boro
09 - Demarest Boro	10 - Dumont Boro
12 - East Rutherford Boro	13 - Edgewater Boro
11 - Elmwood Park Boro	14 - Emerson Boro
15 - Englewood City	16 - Englewood Cliffs Boro
17 - Fair Lawn Boro	18 - Fairview Boro
19 - Fort Lee Boro	20 - Franklin Lakes Boro
21 - Garfield Boro	22 - Glen Rock Boro
23 - Hackensack City	24 - Harrington Park Boro
25 - Hasbrouck Heights Boro	26 - Haworth Boro
27 - Hillsdale Boro	28 - Hohokus Boro
29 - Leonia Boro	30 - Little Ferry Boro
31 - Lodi Boro	32 - Lyndhurst Twp
33 - Mahwah Twp	34 - Maywood Boro
35 - Midland Park Boro	36 - Montvale Boro
37 - Moonachie Boro	38 - New Milford Boro
39 - North Arlington Boro	40 - Northvale Boro
41 - Norwood Boro	42 - Oakland Boro
43 - Old Tappan Boro	44 - Oradell Boro
45 - Palisades Park Boro	46 - Paramus Boro
47 - Park Ridge Boro	48 - Ramsey Boro
49 - Ridgefield Boro	50 - Ridgefield Park Village
51 - Ridgewood Village	52 - River Edge Boro
53 - River Vale Twp	54 - Rochelle Park Twp
55 - Rockleigh Boro	56 - Rutherford Boro
57 - Saddle Brook Twp	58 - Saddle River Boro
59 - South Hackensack Twp	60 - Teaneck Twp
61 - Tenafly Boro	62 - Teterboro Boro
63 - Upper Saddle River Boro	64 - Waldwick Boro
65 - Wallington Boro	66 - Washington Twp
67 - Westwood Boro	68 - Wood-Ridge Boro
69 - Woodcliff Lake Boro	70 - Wyckoff Twp

BURLINGTON COUNTY (05)

01 - Bass River Twp	02 - Beverly City
03 - Bordentown City	04 - Bordentown Twp

05 - Burlington City	06 - Burlington Twp
07 - Chesterfield Twp	08 - Cinnaminson Twp
09 - Delanco Twp	10 - Delran Twp
11 - Eastampton Twp	12 - Edgewater Park Twp
13 - Evesham Twp	14 - Fieldsboro Boro
15 - Florence Twp	16 - Hainesport Twp
17 - Lumberton Twp	18 - Mansfield Twp
19 - Maple Shade Twp	20 - Medford Lakes Boro
21 - Medford Twp	22 - Moorestown Twp
23 - Mount Holly Twp	24 - Mount Laurel Twp
25 - New Hanover Twp	26 - North Hanover Twp
27 - Palmyra Boro	28 - Pemberton Boro
29 - Pemberton Twp	30 - Riverside Twp
31 - Riverton Boro	32 - Shamong Twp
33 - Southampton Twp	34 - Springfield Twp
35 - Tabernacle Twp	36 - Washington Twp
37 - Westampton Twp	38 - Willingboro Twp
39 - Woodland Twp	40 - Wrightstown

CAMDEN COUNTY (07)

01 - Audubon Boro	02 - Audubon Park Boro
03 - Barrington Boro	04 - Bellmawr Boro
05 - Berlin Boro	06 - Berlin Twp
07 - Brooklawn Boro	08 - Camden City
09 - Cherry Hill Twp	10 - Chesilhurst Boro
11 - Clementon Boro	12 - Collingswood Boro
13 - Gibbsboro Boro	14 - Gloucester City
15 - Gloucester Twp	18 - Haddon Heights Boro
16 - Haddon Twp	17 - Haddonfield Boro
19 - Hi-Nella Boro	20 - Laurel Springs Boro
21 - Lawnside Boro	22 - Lindenwold Boro
23 - Magnolia Boro	24 - Merchantville Boro
25 - Mount Ephraim Boro	26 - Oaklyn Boro
27 - Pennsauken Twp	28 - Pine Hill Boro
29 - Pine Valley Boro	30 - Runnemede Boro
31 - Somerdale Boro	32 - Stratford Boro
33 - Tavistock Boro	34 - Voorhees Twp
35 - Waterford Twp	36 - Winslow Twp
37 - Woodlynne Boro	

CAPE MAY COUNTY (09)

01 - Avalon Boro	02 - Cape May City
03 - Cape May Point Boro	04 - Dennis Twp
05 - Lower Twp	06 - Middle Twp
07 - North Wildwood City	08 - Ocean City
09 - Sea Isle City	10 - Stone Harbor Boro
11 - Upper Twp	12 - West Cape May Boro
13 - West Wildwood Boro	14 - Wildwood City
15 - Wildwood Crest Boro	16 - Woodbine Boro

CUMBERLAND COUNTY (11)

01 - Bridgeton City	02 - Commercial Twp
03 - Deerfield Twp	04 - Downe Twp
05 - Fairfield Twp	06 - Greenwich Twp

07 - Hopewell Twp
08 - Lawrence Twp
09 - Maurice River Twp
10 - Millville City
11 - Shiloh Boro
12 - Stow Creek Twp
13 - Upper Deerfield Twp
14 - Vineland City

ESSEX COUNTY (13)

01 - Belleville Town
02 - Bloomfield Town
03 - Caldwell Boro
04 - Cedar Grove Twp
05 - East Orange City
06 - Essex Fells Boro
07 - Fairfield Boro
08 - Glen Ridge Boro
09 - Irvington Town
10 - Livingston Twp
11 - Maplewood Twp
12 - Millburn Twp
13 - Montclair Town
14 - Newark City
15 - North Caldwell Boro
16 - Nutley Town
17 - Orange City
18 - Roseland Boro
19 - South Orange Village
20 - Verona Boro
21 - West Caldwell Boro
22 - West Orange Town

GLOUCESTER COUNTY (15)

01 - Clayton Boro
02 - Deptford Twp
03 - East Greenwich Twp
04 - Elk Twp
05 - Franklin Twp
06 - Glassboro Boro
07 - Greenwich Twp
08 - Harrison Twp
09 - Logan Twp
10 - Mantua Twp
11 - Monroe Twp
12 - National Park Boro
13 - Newfield Boro
14 - Paulsboro Boro
15 - Pitman Boro
16 - South Harrison Twp
17 - Swedesboro Boro
18 - Washington Twp
19 - Wenonah Boro
20 - West Deptford Twp
21 - Westville Boro
22 - Woodbury City
23 - Woodbury Heights Boro
24 - Woolwich Twp

HUDSON COUNTY (17)

01 - Bayonne City
02 - East Newark Boro
03 - Guttenberg Town
04 - Harrison Town
05 - Hoboken City
06 - Jersey City
07 - Kearny Town
08 - North Bergen Twp
09 - Secaucus Twp
10 - Union City
11 - Weehawken Twp
12 - West New York Town

HUNTERDON COUNTY (19)

01 - Alexandria Twp
02 - Bethlehem Twp
03 - Bloomsbury Boro
04 - Califon Boro
05 - Clinton Town
06 - Clinton Twp
07 - Delaware Twp
08 - East Amwell Twp
09 - Flemington Boro
10 - Franklin Twp
11 - Frenchtown Boro
12 - Glen Gardner Boro
13 - Hampton Boro
14 - High Bridge Boro
15 - Holland Twp
16 - Kingwood Twp
17 - Lambertville City
18 - Lebanon Boro
19 - Lebanon Twp
20 - Milford Boro
21 - Raritan Twp
22 - Readington Twp
23 - Stockton Boro
24 - Tewksbury Twp
25 - Union Twp
26 - West Amwell Twp

MERCER COUNTY (21)

01 - East Windsor Twp
02 - Ewing Twp
03 - Hamilton Twp
04 - Hightstown Boro
05 - Hopewell Boro
06 - Hopewell Twp
07 - Lawrence Twp
08 - Pennington Boro
09 - Princeton Boro
10 - Princeton Twp
11 - Trenton City
12 - Washington Twp
13 - West Windsor Twp

MIDDLESEX COUNTY (23)

01 - Carteret Boro
02 - Cranbury Twp
03 - Dunellen Boro
04 - East Brunswick Twp
05 - Edison Twp
06 - Helmetta Boro
07 - Highland Park Boro
08 - Jamesburg Boro
10 - Metuchen Boro
11 - Middlesex Boro
12 - Milltown Boro
13 - Monroe Twp
14 - New Brunswick City
15 - North Brunswick Twp
09 - Old Bridge Twp
16 - Perth Amboy City
17 - Piscataway Twp
18 - Plainsboro Twp
19 - Sayreville Boro
20 - South Amboy City
21 - South Brunswick Twp
22 - South Plainfield Boro
23 - South River Boro
24 - Spotswood Boro
25 - Woodbridge Twp

MONMOUTH COUNTY (25)

30 - Aberdeen Twp
01 - Allenhurst Boro
02 - Allentown Boro
03 - Asbury Park City
04 - Atlantic Highlands Boro
05 - Avon-By-The-Sea Boro
06 - Belmar Boro
07 - Bradley Beach Boro
08 - Brielle Boro
09 - Colts Neck Twp
10 - Deal Boro
11 - Eatontown Boro
12 - Englishtown Boro
13 - Fair Haven Boro
14 - Farmingdale Boro
15 - Freehold Boro
16 - Freehold Twp
39 - Hazlet Twp
17 - Highland Boro
18 - Holmdel Boro
19 - Howell Twp
20 - Interlaken Boro
21 - Keansburg Boro
22 - Keyport Boro
23 - Little Silver Boro
24 - Loch Arbour Village
25 - Long Branch City
26 - Manalapan Twp
27 - Manasquan Boro
28 - Marlboro Twp
29 - Matawan Boro
31 - Middletown Twp
32 - Millstone Twp
33 - Monmouth Beach Boro
35 - Neptune City Boro
34 - Neptune Twp
37 - Ocean Twp
38 - Oceanport Boro
40 - Red Bank Boro
41 - Roosevelt Boro
42 - Rumson Boro
43 - Sea Bright Boro
44 - Sea Girt Boro
45 - Shrewsbury Boro
46 - Shrewsbury Twp
47 - South Belmar Boro
48 - Spring Lake Boro
49 - Spring Lake Heights Boro
36 - Tinton Falls Boro
50 - Union Beach Boro
51 - Upper Freehold Twp
52 - Wall Twp
53 - West Long Branch Twp

MORRIS COUNTY (27)

01 - Boonton Town
02 - Boonton Twp
03 - Butler Boro
04 - Chatham Boro
05 - Chatham Twp
06 - Chester Boro
07 - Chester Twp
08 - Denville Twp
09 - Dover Town
10 - East Hanover Twp
11 - Florham Park Boro
12 - Hanover Twp
13 - Harding Twp
14 - Jefferson Twp
15 - Kinnelon Boro
16 - Lincoln Park Boro
17 - Madison Boro
18 - Mendham Boro
19 - Mendham Twp
20 - Mine Hill Twp
21 - Montville Twp
23 - Morris Plains Boro
22 - Morris Twp
24 - Morristown Town
26 - Mount Arlington Boro
27 - Mount Olive Twp
25 - Mountain Lakes Boro
28 - Netcong Boro
29 - Parsippany Troy-Hills Twp
30 - Passaic Twp
31 - Pequannock Twp
32 - Randolph Twp
33 - Riverdale Boro
34 - Rockaway Boro
35 - Rockaway Twp
36 - Roxbury Twp
37 - Victory Gardens Boro
38 - Washington Twp
39 - Wharton Boro

OCEAN COUNTY (29)

01 - Barnegat Light Boro
33 - Barnegat Twp
02 - Bay Head Boro
03 - Beach Haven Boro
04 - Beachwood Boro
05 - Berkeley Twp
06 - Brick Twp
07 - Dover Twp
08 - Eagleswood Twp
09 - Harvey Cedars Boro
10 - Island Heights Boro
11 - Jackson Twp
12 - Lacey Twp
13 - Lakehurst Boro
14 - Lakewood Twp
15 - Lavalette Boro
16 - Little Egg Harbor Twp
17 - Long Beach Twp
18 - Manchester Twp
19 - Mantaloking Boro
21 - Ocean Gate Boro
20 - Ocean Twp
22 - Pine Beach Boro
23 - Plumsted Twp
25 - Point Pleasant Beach Boro
24 - Point Pleasant Boro
26 - Seaside Heights Boro
27 - Seaside Park Boro
28 - Ship Bottom Boro
29 - South Toms River Boro
30 - Stafford Twp
31 - Surf City Boro
32 - Tuckerton Boro

PASSAIC COUNTY (31)

01 - Bloomingdale Boro
02 - Clifton City
03 - Haledon Boro
04 - Hawthorne Boro
05 - Little Falls Twp
06 - North Haledon Boro
07 - Passaic City
08 - Paterson City
09 - Pompton Lakes Boro
10 - Prospect Park Boro
11 - Ringwood Boro
12 - Totowa Boro
13 - Wanaque Boro
14 - Wayne Twp
15 - West Milford Twp
16 - West Paterson Boro

SALEM COUNTY (33)

01 - Alloway Twp
13 - Carney's Point Twp
02 - Elmer Boro
03 - Elsinboro Twp

04 - Lower Alloways Creek Twp
05 - Mannington Twp
06 - Oldmans Twp
07 - Penns Grove Boro
08 - Pennsville Twp
09 - Pilesgrove Twp
10 - Pittsgrove Twp
11 - Quinton Twp
12 - Salem City
14 - Upper Pittsgrove Twp
15 - Woodstown Boro

SOMERSET COUNTY (35)

01 - Bedminster Twp
02 - Bernards Twp
03 - Bernardsville Boro
04 - Bound Brook Boro
05 - Branchburg Twp
06 - Bridgewater Twp
07 - Far Hills Boro
08 - Franklin Twp
09 - Green Brook Twp
10 - Hillsborough Twp
11 - Manville Boro
12 - Millstone Boro
13 - Montgomery Twp
14 - North Plainfield Boro
15 - Peapack-Gladstone Boro
16 - Raritan Boro
17 - Rocky Hill Boro
18 - Somerville Boro
19 - South Bound Brook Boro
20 - Warren Twp
21 - Watchung Boro

SUSSEX COUNTY (37)

01 - Andover Boro
02 - Andover Twp
03 - Branchville Boro
04 - Byram Twp
05 - Frankford Twp
06 - Franklin Boro
07 - Fredon Twp
08 - Green Twp
09 - Hamburg Boro
10 - Hampton Twp
11 - Hardyston Twp
12 - Hopatcong Boro
13 - Lafayette Twp
14 - Montague Twp
15 - Newton Town
16 - Ogdensburg Boro
17 - Sandyston Twp
18 - Sparta Twp
19 - Stanhope Boro
20 - Stillwater Twp
21 - Sussex Boro
22 - Vernon Twp
23 - Walpack Twp
24 - Wantage Twp

UNION COUNTY (39)

01 - Berkeley Heights Twp
02 - Clark Twp
03 - Cranford Twp
04 - Elizabeth City
05 - Fanwood Boro
06 - Garwood Boro
07 - Hillside Twp
08 - Kenilworth Boro
09 - Linden City
10 - Mountainside Boro
11 - New Providence Boro
12 - Plainfield City
13 - Rahway City
14 - Roselle Boro
15 - Roselle Park Boro
16 - Scotch Plains Twp
17 - Springfield Twp
18 - Summit City
19 - Union Twp
20 - Westfield Town
21 - Winfield Twp

WARREN COUNTY (41)

01 - Allamuchy Twp
02 - Alpha Boro
03 - Belvidere Town
04 - Blairstown Twp
05 - Franklin Twp
06 - Frelinghuysen Twp
07 - Greenwich Twp
08 - Hackettstown Town
09 - Hardwick Twp
10 - Harmony Twp
11 - Hope Twp
12 - Independence Twp

13 - Knowlton Twp
14 - Liberty Twp
15 - Lopatcong Twp
16 - Mansfield Twp.
17 - Oxford Twp
18 - Pahaquarry Twp
19 - Phillipsburg Town
20 - Pohatcong Twp
21 - Washington Boro
22 - Washington Twp
23 - White Twp

DESCRIPTION OF NJGS CASE INDEX SITES

The NJGS Case Index Sites listing contains the following fields:

CONTAM: contaminate code
DISTANCE: distance in miles from center of circle
FMCODE1: NJGS primary formation code
FMCODE2: NJGS secondary formation code
LAT: latitude of site
LON: longitude of site
NAME: name and location of site
SITENUM: site identifier
STATUS1: current status of site
STATUS2: further description of site status

The data in this listing is down-loaded on a regular basis from the New Jersey Geological Survey's Case Index File. The actual transfer date is printed on the left side of the enclosed map. This file contains many of the identified potential pollution sites in the State, but does not include all of them. For example the file does not generally include spill sites. Recognizing the fact that this list may contain significant errors and omissions, it is advisable to use this resource as a guide and to verify all information.

If you have any questions, please call or write to us in reference to the "Radius Program" at:

NJDEP
Division of Water Resources
Bureau of Water Allocation
CN-029
Trenton, NJ 08625

(609) 292-2957

Please see the attached sheets for definitions of the codes used in the NJGS Case Index Sites listing.

CODES USED IN THE NJGS CASE INDEX SITES LISTING

This packet contains definitions of the database codes used in the NJGS Case Index Sites listing.

CONTAM

00 = ORGANIC CHEM (VOLATILE)
01 = ORGANIC CHEM (NONVOLATILE)
02 = CHLOROFORM
03 = '1,2 - DICHLOROETHANE'
04 = '1,1,1 - TRICHLOROETHANE'
05 = TETRACHLOROETHYLENE
06 = DICHLOROETHYLENE
07 = TRICHLOROETHYLENE
08 = CARBON TETRACHLORIDE
09 = METHYLENE CHLORIDE
10 = ACETONE
11 = BENZENE
12 = TOLUNE
13 = XYLENE
14 = METHYL ISOBUTYL KETONE
15 = ETHYLENE DICHLORIDE
16 = METHYL ETHYL KETONE
17 = TETRAHYDROFURAN
18 = '1,2 - DICHLOROETHENE'
19 = '1,1 - DICHLOROETHENE'
20 = '1,1 - DICHLOROETHANE'
21 = '1,1,2,2 - TETRACHLOROETHYLENE'
22 = '1,1,2,2 - TETRACHLOROETHANE'
23 = TRICHLOROFLUOROMETHANE
24 = CHLOROBENZENE
25 = ETHYLBENZENE
26 = '1,2 - DICHLOROBENZENE'
27 = DICHLOROFLUOROMETHANE
28 = STYRENE
29 = ISOPROPYL ALCOHOL
30 = VINYL CHLORIDE
31 = HEXANE
32 = HEPTANE
33 = PHENTANE
34 = PHENOLS
35 = METALS
36 = LEAD
37 = IRON
38 = MERCURY
39 = CHROMIUM
41 = ARSENIC
42 = CADMIUM
43 = CHLORIDE
44 = SODIUM
45 = NITRATE

46 = SULFATE
47 = PESTICIDES
48 = HERBICIDES
49 = NATURAL RADIOACTIVITY
50 = 'PCB''S'
51 = GASOLINE
52 = DIESEL FUEL
53 = FUEL OIL
54 = INORGANIC CHEMICALS
55 = GREASES AND FATS
56 = SLUDGE
57 = ACID
58 = LEACHATE
59 = METHANE GAS
60 = DYE
61 = IODINE
62 = EXPLOSIVES
63 = PETROLEUM HYDROCARBONS
64 = PHARMACEUTICALS
65 = SURFACTANTS
66 = SEPTIC DISCHARGES
67 = RADIOACTIVE WASTE
68 = UNKNOWN
69 = TRICHLORETHYLENE
70 = COAL TAR
71 = ASBESTOS
72 = DIOXIN

FMCODE

0000 = 'N/A'
0100 = QUATERNARY
0101 = MEADOW MAT
0102 = ALLUVIUM
0103 = FILL
0104 = BEACH SANS
0110 = GLACIAL,UNDIFFERENTIATED
0120 = GLACIAL,UNSTRATIFIED TILL
0130 = STRATIFIED DRIFT
0140 = MORAINE
0144 = TERMINAL MORAINE
0148 = RECESSIONAL MORAINE
0150 = BRIDGETON
0160 = CAPE MAY
0161 = HOLLY BEACH MBR
0170 = PENNSAUKEN
1000 = TERTIARY
1010 = BEACON HILL
1020 = COHANSEY SAND
1025 = COHANSEY KIRKWOOD
1030 = KIRKWOOD SAND
1031 = UPPER MEMBER
1032 = LOWER MEMBER

1033 = PINEY POINT MBR
1040 = SHARK RIVER MARL
1050 = MANASQUAN MARL
1060 = VINCENTOWN SAND
1070 = HORNERSTOWN MARL
2000 = CRETACEOUS
2010 = RED BANK AND TINTON SANDS
2020 = NAVESANK MARL
2030 = MOUNT LAUREL WENONAH SANDS
2034 = MOUNT LAUREL SAND
2038 = WENONAH SAND
2040 = MARSHALLTOWN FM
2050 = ENGLISHTOWN SAND
2060 = WOODBURY CLAY
2070 = MERCHANTVILLE CLAY
2080 = MAGOTHY RARITAN FM
2081 = MAGOTHY RARITAN UPPER MBR
2084 = MAGOTHY RARITAN MIDDLE MBR
2088 = MAGOTHY RARITAN LOWER MBR
2090 = MAGOTHY FM
2091 = AMBOY STONEWARE CLAY MBR
2092 = OLD BRIDGE SAND MBR
2093 = SOUTH AMBOY FIRE CLAY MBR
2094 = SAYREVILLE SAND MBR
2095 = WOODBRIDGE CLAY MBR
2096 = FARRINGTON SAND MBR
2097 = RARITAN FIRE CLAY MBR
3000 = TRIASIC JURASSIC
3010 = BOONTON FM
3020 = BASALT UNDIFFERENTIATED
3021 = HOOK MT BASALT
3030 = TOWACO FM
3022 = PREAKNESS BASALT
3040 = FELTVILLE FM
3023 = ORANGE MT BASALT
3050 = DIABASE
3060 = CONGLOMERATE (HAMMER CREEK)
3070 = BRUNSWICK FM
3080 = LOCKATONG FM
3090 = STOCKTON FM
4000 = DEVONIAN
4010 = SKUNNEMUNK CNGLM
4020 = BELLVALE SS PEQUANAC SH
4030 = KANOUSE SANDSTONE
4040 = MARCELLUS SHALE
4050 = ONONDAGE LS
4060 = ESOPUS GRIT
4070 = ORISKANY BECRAFT LS
4080 = NEW SCOTLAND COEYMANS
5000 = SILURIAN
5010 = BOSSARDVILLE LS
5020 = DECKER FM
5030 = LONGWOOD SHALE
5040 = POXONO ISLAND

5050 = GREENPOND CONGLOMERATE
5060 = HIGH FALLS
5070 = SHAWANGUNK CONGLOMERATE
6000 = ORDOVICIAN
6010 = MARTINSBURG SHALE
6011 = PEN ARGYL MBR
6012 = RAMSEYBURG MBR
6013 = BUSHKILL MBR
6020 = JACKONSBURG LS
6030 = ONTLEAUNEE FM
6031 = HARMONYVALE MBR
6032 = BEAVER RUN MBR
6040 = EPLER FM
6041 = LAFAYETTE MBR
6042 = BIG SPRINGS MBR
6043 = BRANCHVILLE MBR
6050 = RICKENBACK DOLOMITE
6060 = MANHATTAN SCHIST
7000 = CAMBRO ORDOVICIAN
7010 = KITTATINNY SUPERGROUP
8000 = CAMBRIAN
8010 = ALLENTOWN FM
8011 = UPPER MBR
8012 = LIMEPORT MBR
8020 = LEITHSVILLE FM
8021 = WALLKILL MBR
8022 = HAMBURG MBR
8023 = CALIFON MBR
8030 = HARDYSTONE SAND
9000 = PRE CAMBRIAN
9010 = GRANITE
9011 = HORNBLEND GRANITE
9020 = GNEISS
9021 = GRANITE GNEISS
9022 = HORNBLEND GNEISS
9023 = QUARTZ OLIGOCLAISE GNEISS
9030 = ALASKITE
9040 = SYENITE
9041 = SYENITE GNESS
9050 = PYROXENE GRANITE
9060 = MICROCLINE GNEISS
9070 = FRANKLIN LIMESTONE
9080 = AMPHIBOLITE
9090 = BIOTITE GNEISS
9091 = MIXED GNEISS;

STATUS1

1 = INVESTIGATION 2 = AQUIFER RESTOR CONT
3 = REQUEST FOR GEOLOG
4 = MONITORING
5 = LITIGATION
6 = CLOSED

7 = OTHER
8 = BACKLOGGED
9 = TRANS PERMITS
0 = UNKNOWN
F = FIELD REC PROVIDED

STATUS2

O = INVEST CONT
A = CLEAN UP PLAN
B = SAMPLING PLAN
C = INITIAL INVEST
D = RQST PRPSL (RFP)
E = REMEDIAL INVEST
F = FSBLTY STUDY (FS)
G = PLAN, CONST REMEDIAL
H = FREE PRODUCT RECOVERY
I = DSLVD FRACTION RECOV
J = FREE, DSSLVD RECOV
K = CASE ABSORBED

REFERENCE NO. 12

Uncontrolled Hazardous Waste Site Ranking System

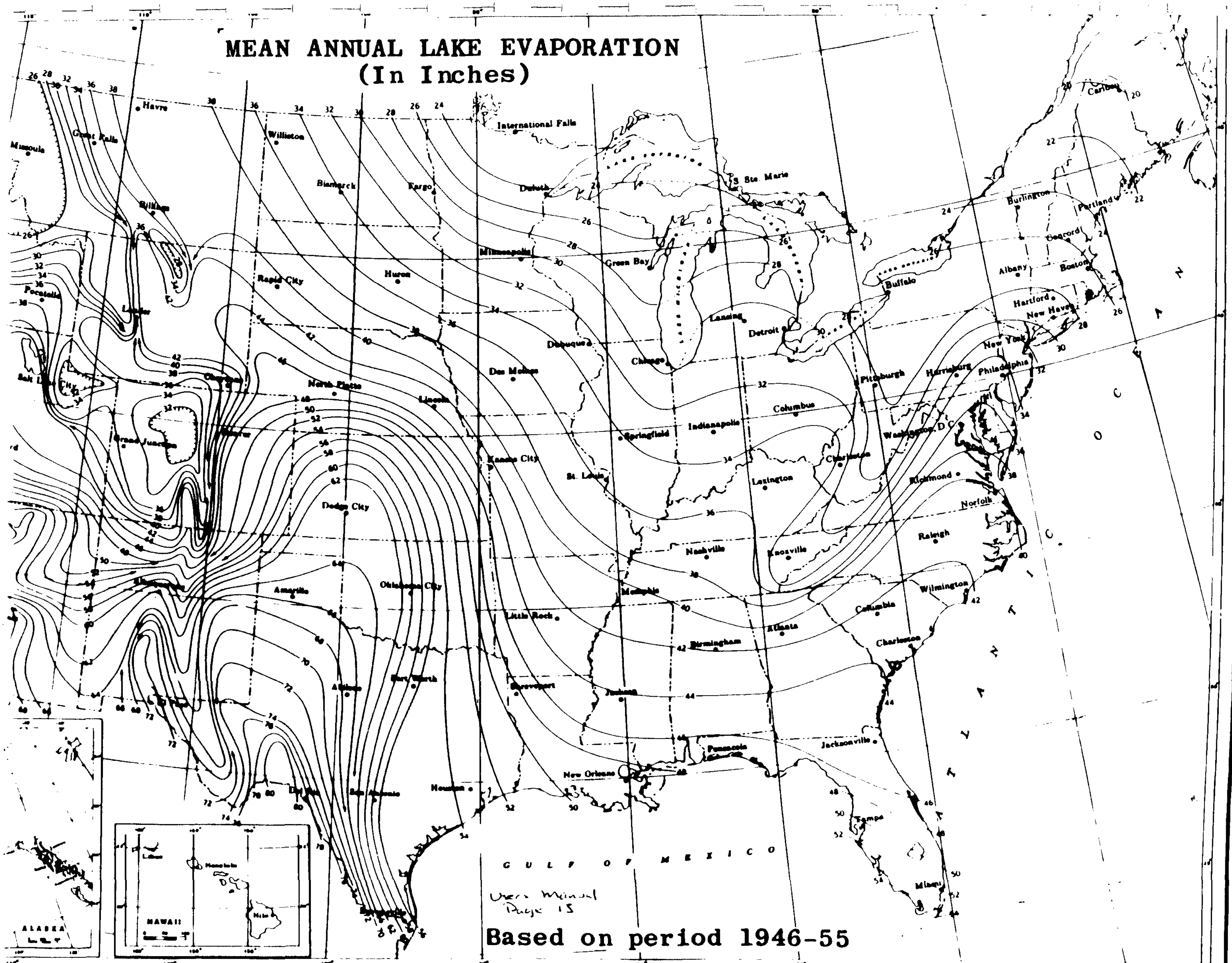
A Users Manual
(HW-10)

Originally Published in
the July 16, 1982, *Federal Register*

United States
Environmental Protection
Agency

1984

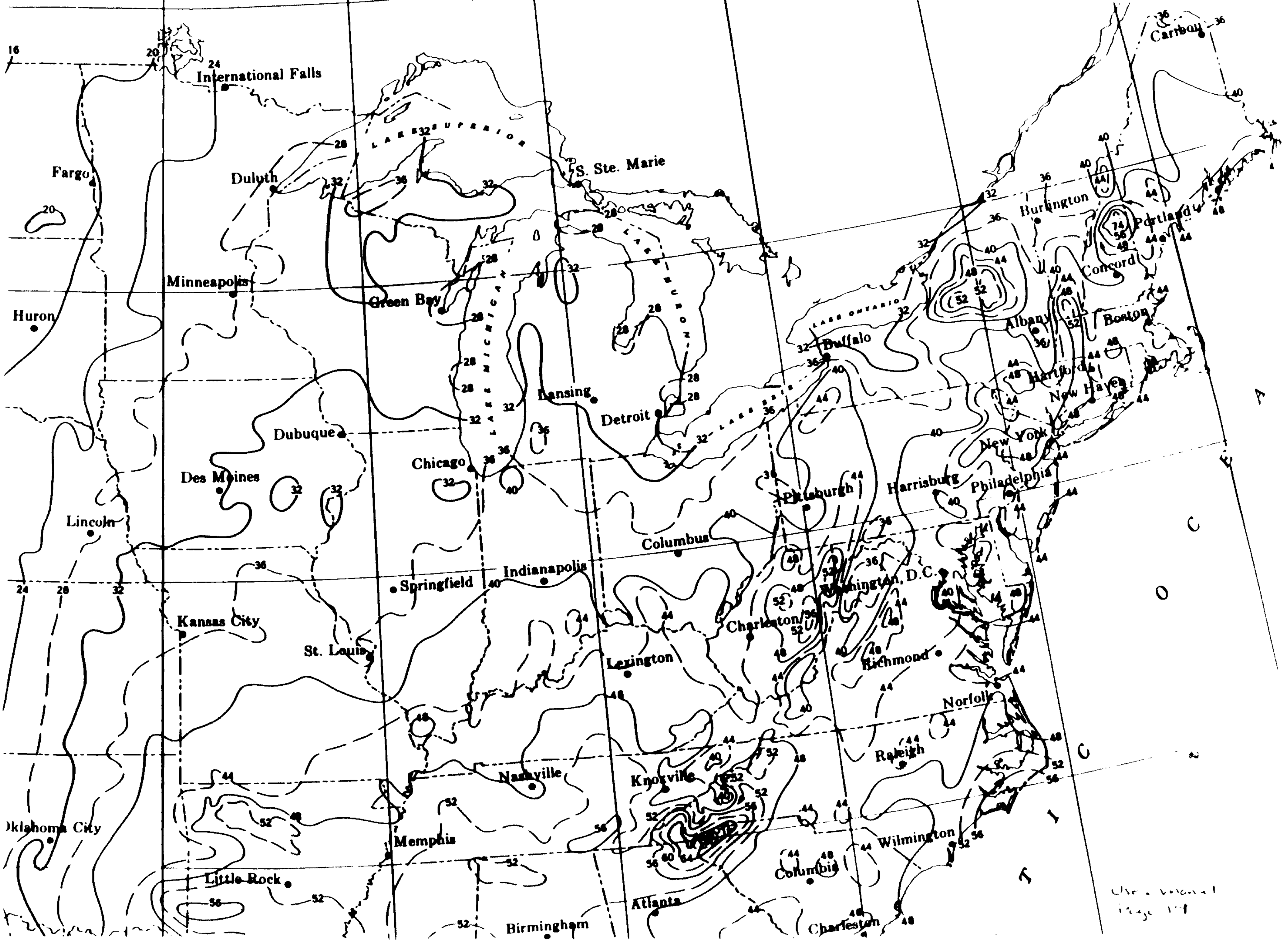
MEAN ANNUAL LAKE EVAPORATION
(In Inches)



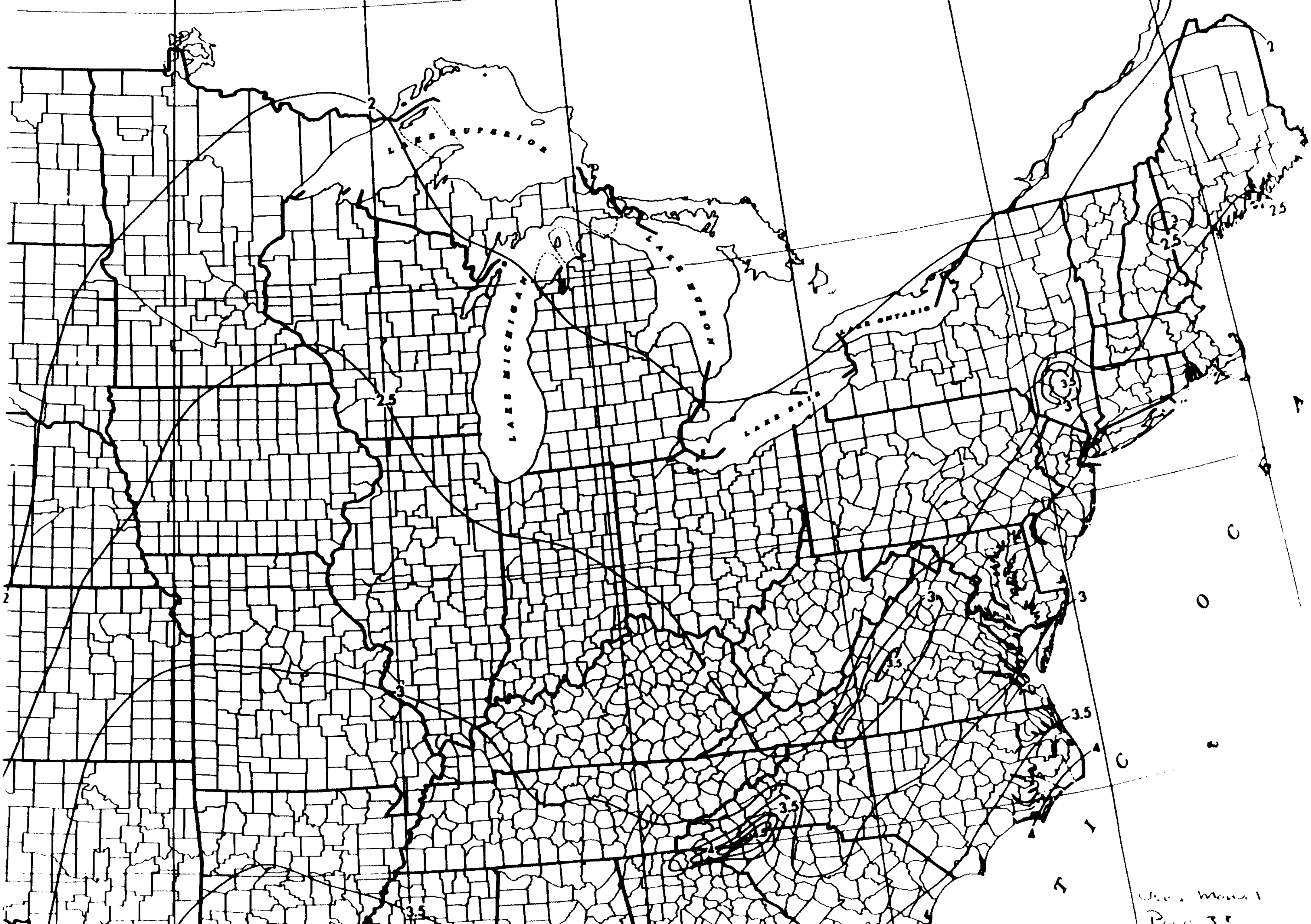
Users Manual
Page 15

Based on period 1946-55

NORMAL ANNUAL TOTAL PRECIPITATION (Inches)



1 YEAR 24-HOUR RAINFALL (inches)



User's Manual
Page 35

REFERENCE NO. 13

STAFF REPORT

In the matter of

Wheaton Glass Company

Application No. 2095P to renew permit to divert from 15 wells in the City of Millville, Cumberland County

In compliance with the provisions of N.J.S.A. 58:1A-1 et seq., Wheaton Glass Company, Millville, New Jersey filed an application with the Division of Water Resources on February 29, 1982 for renewal of a permit to divert a maximum of 43.6 million gallons of water during any month (mgm) at a maximum rate of 1990 gallons per minute from 15 existing wells screened in the Cohansey formation. The wells are located on the property of the Wheaton Glass Company in the City of Millville, Cumberland County.

Diversion is used for cooling compressors and in manufacturing glass containers.

Diversion is in the Delaware River Basin.

This is a corrected staff report reflecting historic records which were not available at the time of the recent renewal permit dated January 4, 1983.

Background

1. This permit is a renewal of an allocation granted by the following:

Permit No.	Date Issued	Source of Water	Diversion Amount (mgm)
P-409	8/18/66	Cohansey	void
P-655	11/18/68	Cohansey	18.0
P-786	6/15/70	Cohansey	22.0
P-872	10/16/72	Cohansey	22.0 (or 62 mgm if wastewater treatment facilities are provided)
2095P	1/4/83	Cohansey	18.0

2. The diversion includes the following:

Well No.	Well Permit No.	Date Constructed	Depth (ft.)	Pump Capacity (gpm)	Yield (gpm)
1	55-50	1942	132	150	120
2	55-51	1947	34	7	---
3	55-52	1947	34	7	---
4	55-53	1962	42	7	---
5	35-733	1959	70	100	60
6	55-54	1956	70	110	60
7A	35-977	1959	120	100	---
8	35-734	1959	90	90	24
9	35-909	1966	130	---	---
10	35-922	1966	140	190	---
11	35-969	1968	150	500	500
12	35-996	1970	150	400	400
13	35-1155	1972	146	500	600
14	35-1156	1972	146	500	600
15	35-1418	1975	130	65	65

Findings of Fact

1. A review of quarterly diversion reports indicates the following water use:

Year	Maximum Monthly Use	Average Monthly Use	Existing Allocation	Grandfather Rights
1982(2095P)	9.33	7.7	22.0 or 62.0	21.6
1981(P-786)	11.40	9.8		

(P-872 There is no record of diversion reports having been filed under P-872 approval).

2. The following static water level data is available:

Well No.	Static Water Levels (below well head) When constructed (date)	(level)	Recent (date)	(level)
7A	1970	9	not known	
11	1969	9	not known	
12	1972	19	not known	

3. The following long-term pumping test data is available:

Well No.	Date of Test	Yield (gpm)	Drawdown (ft.)	Static Level (ft)	Pumping Time (hrs)

11	3/11/69	75	1.9	9	2
12	3/14/72	60	2.2	19	1
7A	3/11/69	70	3.5	9	1

4. Other sub-surface diversions within a one-mile radius include the following:

Well Owner	Well No.	Well Permit No.	Depth (ft.)	Capacity (gpm)	Distance (miles)
The West Company	3	35-973	145	450	0.4

5. Public water supply wells within a 5-mile radius include the following:

Well Owner	No. of Wells	Depth (ft.)	Capacity (gpm)	Distance (miles)
Millville City	1	140	400	1.0

6. Landfills and sources of groundwater within a 5-mile radius include the following:

Name of Source	Distance (miles)	Formation Affected	Status
Nascolite Co. (Organic Compounds)	2.0	Bridgeton	Investigation Continuing

(This contaminated site is being investigated and supervised by the Bureau of Ground Water Pollution Analysis which will plan for decontamination, as necessary).

7. The following wells have been abandoned or are unused:

Well No.	Well Permit No.	Depth(feet)	Status
7	----	120	Sealed

8. Water, after use, is discharged into Petticoat Creek after passing through a series of cooling ponds. At the point of discharge, pH is monitored and adjusted by the addition of soda ash, as necessary. Discharge is made under NJPDES Permit No. NJ 004171. The treatment facilities are not connected to a sanitary sewer.

Staff Analysis

1. The water use is reasonable. In 1972 it was decided that the public interest requires connection of the existing treatment facilities to a sanitary sewer. Applicant is now controlled by NJPDES permit which sets discharge requirements.

. The diversion probably will not have an adverse affect on nearby wells because the wells have been in operation since 1942 without any objections or complaints.

3. No data exists to make a determination as to the state of natural replenishment of the ground water. Static water level reports should be required as a condition of this permit.

4. Diversion will not likely cause groundwater pollution because there is no landfill. The Nascolite site is 2 miles away from the diversion and will probably not affect groundwater quality.

5. There is little probability of salt water intrusion. Static water levels are generally above MSL in this area. Also, the Cohansey formation is not known to be contaminated here.

Conclusions

1. The allocation is necessary and in the public interest.

2. The diversion will not contribute to ground water pollution or salt water intrusion.

3. The diversion will probably not exceed natural replenishment, and will not unduly interfere with other users.

Recommendations

Issuance of the permit is recommended subject to the general conditions and to the following specific conditions:

1. The amount of water that may be diverted under this renewal permit shall be as follows:

Well Permit No.	Well Name or Designation	Pump capacity (gpm)	Formation
55-50	1	150	Cohansey
55-51	2	7	Cohansey
55-52	3	7	Cohansey
55-53	4	7	Cohansey
35-733	5	100	Cohansey

55-54	6	110	Cohansey
35-977	7A	100	Cohansey
35-734	8	90	Cohansey
35-909	9	---	Cohansey
35-922	10	190	Cohansey
35-969	11	500	Cohansey
35-996	12	400	Cohansey
35-1155	13	500	Cohansey
35-1156	14	500	Cohansey
35-1418	15	65	Cohansey

2. The total allocation from the above sources shall not exceed 43.6 million gallons per month at a maximum rate of 1990 gpm.

3. All wells shall be metered. The total diversion for each month from each well shall be reported quarterly to the Bureau of Water Allocation under Permit No. 2095P. Applicant shall submit within 60 days of receipt of this permit a plan for monitoring diversions using the form or format available from the Bureau of Water Allocation. Wells shall be equipped with a tag showing the well permit numbers listed above.

4. Well shall be constructed so that water level measurements can be made by tape at any time. Applicant shall submit with quarterly diversion reports the static water level of wells identified in the monitoring plan (See 3. above). Measurement shall be made when the well pump has been shut down for a recovery period of 12 to 24 hours.

5. The pumping equipment capacity shall not be increased without prior approval by the Division.

6. Permittee shall have the right to apply at any time for modification of this permit by submission of the appropriate application forms. Permittee may informally discuss the terms and conditions of this permit at any time with the Bureau of Water Allocation. An application for renewal shall be filed 3 months prior to the expiration date.

7. If the permittee fails to comply with any of the terms and condtions herein, or in the public interest and after due process, this approval may be reviewed for possible modification or revocation thereof.

8. The Division, at its option, may cause the permit to be reviewed at intervals of not less than 5 years to examine the need for the allocation and to determine compliance with the terms and conditions of the permit and whether a modification to the permit is necessary.

9. The permittee is subject to such initial, renewal and annual. fees as may by prescribed by the regulations.

10. Approval of this application is subject to the granting of any approval by the Delaware River Basin Commission which may be required under the provisions of the Delaware River Basin Compact.

11. This permit shall expire on September 30, 2000.

12. This permit shall not become operative unless and until the applicant has filed with the Division within 60 days from the date of transmittal hereof, written acceptance of the terms and conditions hereby imposed.

Respectfully submitted,

Aziz Syed
Aziz Syed
Bureau of Water Allocation

OK WTW
8/30

REFERENCE NO. 14

STAFF REPORT

In the matter of City of Millville	Application No. 5316 to renew permit to divert water from eight existing wells in the City of Millville, Cumberland County

In compliance with the provisions of N.J.S.A. 58:1A-1 et seq., the City of Millville, P.O. Box 609, Millville, New Jersey is presumed to have filed an application with the Division of Water Resources for renewal of a permit to divert a maximum of 200 million gallons of water during any month (mgm) at a maximum rate of 6300 gallons per minute from existing Airport Well Nos. 1, 2 and 3, the Bridgeton Pike well and Ware Avenue Well Nos. 13, 14, 15 and 16, 106 to 290 feet deep, screened in the Cohansey-Kirkwood formation. Airport Well Nos. 1, 2 and 3 are located at the City of Millville Airport; the Bridgeton Pike well is located along Millville-Bridgeton Pike 2500 feet west of the intersection with Center Grove Road; and the remaining wells are located along Ware Avenue. All wells are located in the City of Millville, Cumberland County.

Diversion is for the purpose of public water supply.

Diversion is in the Delaware River Basin.

The applicant requests no change in their existing diversion rights and no public notice is required.

Background

1. This permit is a renewal of an allocation granted by the following:

Permit No.	Date Issued	Source of Water	Diversion Amount	
W.S. 1814	4/21/80	All sources	200	mgm
		Well No. 16	35.712	mgm
		Well Nos. 10A,15,16	65	mgm
		Well No. 13	45	mgm
		Airport Wells	90	mgm
		Bridgeton Pike Well	30	mgm
W.S. 1459	10/21/68	All sources	225	mgm
		Well No. 15	30	mgm
W.S. 1163	4/16/64	All sources	225	mgm
		Ware Ave. Wells	105	mgm
		Airport wells and Bridgeton Pike well	120	mgm
W.S. 867	9/19/55	All sources	90	mgm
W.S. 592	6/26/44	All sources	90	mgm

The City of Millville Water System was originally the People's Water Company which began operation in 1903. In September 1952, the City of Millville purchased the Millville Water Company. The Millville Water Company's source of diversion was Union Lake on the Maurice River. On October 30, 1952, diversion rights of 4.5 mgd from Union Lake were granted to the City of Millville. The use of Union Lake was abandoned in 1964 because of the City's inability to treat the water satisfactorily.

2. The diversion includes the following:

Well No.	Well Permit No.	Date Constructed	Screen Depth (feet)	Pump Capacity (gpm)	Yield (gpm)
Airport Well No. 1	55-56	12/01/42	159-181	700	300
Airport Well No. 2	55-57	12/02/42	147-169	700	300
Airport Well No. 3	35-862	8/05/64	161-191	1000	1000
Bridgeton Pike	35-548	10/07/55	118-150	700	708
Ware Ave. No. 13	55-58	12/14/64	260-290	800	800
Ware Ave. No. 14	35-924	1966	-120	600	---
Ware Ave. No. 15	35-953	10/03/67	131-151	1000	430
Ware Ave. No. 16	35-2522	8/27/80	86-106	800	805

3. The diversion serves the City of Millville.

Findings of Fact

1. A review of quarterly diversion reports indicates the following water use:

Year	Maximum Monthly Use (mgm)	Average Monthly Use (mgm)	Existing Allocation (mgm)
1984	137.5	113.7	200
1983	172.9	118.3	200

2. The population served is approximately 24,500, which represents an average consumption of 135 gpcd, and peak consumption of 163 gpcd during 1984. On the average, 7 percent of the water diverted is used by industries. The above consumption figures have been corrected for this.

3. Static water level data includes:

Well No.	Static Water Levels (below well head) When Constructed (date)	(level)	Recent (date)	(level)		
1	----		3/84	110,	12/84	94
2	----		3/84	70,	12/84	64
3	8/64	30	9/84	80,	12/84	78
Bridgeton Pike	10/55	44	3/84	59,	12/84	56
13	9/64	Flowing	12/84	Flowing		
14	----		3/84	72,	12/84	68
15	10/67	14	3/84	56,	12/84	54
16	4/80	6	3/84	68,	12/84	66

4. The following pump test data is available:

Well No.	Date of Test	Yield (gpm)	Drawdown (ft.)	Static Level (ft.)	Pumping Time (hrs.)
3	8/05/64	1000	58	30	8
Bridgeton Pike	10/07/55	708	44	45	8
15	10/06/67	430	21	14	8
16	4/23/80	805	72	6	24

5. Other sub-surface diversions within one-mile radius include the following:

Well Owner	Well No.	Well Permit No.	Depth (ft.)	Capacity (gpm)	Distance (Miles)
Wheaton Glass					1.0

6. Public water supply wells within a 5-mile radius include the following:

Well Owner	No. of Wells	Depth (ft.)	Capacity (gpm)	Distance (miles)
City of Vineland	1	174	2000	4.3

7. Nearest landfills and other hazardous surface disposal sites include:

Name of Source	Distance (miles)	Formation Affected	Status
Exxon	0.1	Bridgeton/Cohansey	Case closed
Bi-Lo Station	2.1	Cohansey	Case closed
Millville City Landfill	1.3	Cohansey	Monitoring

8. The following wells have been abandoned or are unused:

Well No.	Well Permit No.	Depth (feet)	Status
1	drilled in 1901	107	Unknown
2	drilled in 1901	107.5	Unknown
3	drilled in 1901	105.5	Unknown
4	drilled in 1901	105.5	Unknown
5	drilled in 1901	118	Unknown
6	drilled in 1901	104	Unknown
7	drilled in 1925	120	Unknown
8	drilled in 1925	105	Unknown
9	drilled in 1925	122	Unknown
10	drilled in 1944	120	Unknown
11	drilled in 1944	110	Sealed
12	35-21	122	Unknown
10A	35-968	105	Sealed
---	35-932	142	Unknown
Orange Street	35-406	149	Observation Well
---	35-476	56	Unknown
Ware Ave.Test Well No. 1	35-841	167	Unknown
Ware Ave.Test Well No. 2	35-842	351	Unknown
Ware Ave.Test Well No. 3	35-843	366	Unknown
Ware Ave.Test Well No. 1-67	35-952	141	Sealed

9. Water, after use, is discharged to the Millville City Sewage Plant for treatment and discharged to the Maurice River under Permit No. 0029467. The treatment works are not under a sewer connection ban or other restriction imposed by NJDEP.

10. The water system has storage capacity of 7.3 MG, as compared with a water demand of 3.7 MGD.

11. The system has no interconnections with adjacent systems.

12. Applicant has no agreements for sale or purchase of water.

13. The applicant has obtained prior approval from the Delaware River Basin Commission under Docket No. D-80-37CP.

14. The system is 99 percent metered.

Staff Analysis

1. The water use is above average. Conservation measures and leak detection may reduce the high usage figures.

2. The diversion probably will not have an adverse affect on nearby wells because there have been no complaints of interference. The Wheaton Glass Co. wells are probably the only wells in the area that would be influenced by pumping of the Millville Wells.

3. The Cohansey aquifer is a prolific source of water. For example, Well No. 13 is artesian.

4. There are two groundwater pollution cases in the area which are being investigated. Both cases are more than one mile away from the applicant's wells.

5. There is little probability of salt water intrusion because the diversion is located several miles inland.

6. There is no need to develop an alternate source of water at this time.

Conclusions

1. The allocation is necessary and in the public interest.

2. The diversion probably will not contribute to ground water pollution or salt water intrusion.

3. The diversion will not exceed natural replenishment, and will not unduly interfere with other users.

Recommendations

Issuance of the permit is recommended subject to the standard conditions and to the following specific conditions:

1. The amount of water that may be diverted under this renewal permit shall be as follows:

Well Permit No.	Well Name or Designation	Pump Capacity (gpm)	Formation
55-56	Airport Well No. 1	700	Cohansey-Kirkwood
55-57	Airport Well No. 2	700	Cohansey-Kirkwood
35-862	Airport Well No. 3	1000	Cohansey-Kirkwood
35-548	Bridgeton Pike	700	Cohansey-Kirkwood
55-58	Ware Ave. No. 13	800	Cohansey-Kirkwood
35-924	Ware Ave. No. 14	600	Cohansey-Kirkwood
35-953	Ware Ave. No. 15	1000	Cohansey-Kirkwood
35-2522	Ware Ave. No. 16	800	Cohansey-Kirkwood

2. The total allocation from the above source shall not exceed 200 million gallons

3. [illegible] wellfield, [illegible] Avenue wellfield and the Bridgeton Pike well shall be reported quarterly to the Bureau of Water Allocation under Permit No. 5315. Applicant shall submit within 60 days of receipt of this permit a plan for monitoring diversions using the form or format available from the Bureau of Water Allocation. Wells shall be equipped with a tag showing the well permit number listed above.

4. The applicant shall submit, with the fourth quarterly diversion report: (a) the total annual commercial/industrial water use; (b) the percent of unaccounted for water not metered; (c) the annual daily peak water consumption in gallons per capita per day.

5. Applicant shall submit with quarterly diversion reports, the static water level of wells identified in the monitoring plan (See 3. above). Measurement shall be made when the well pump has been shut down for a recovery period of 12 to 24 hours.

6. Permittee shall seal within 90 days any wells which have been abandoned and are not used for observation purposes. Wells shall be sealed in accordance with the regulations of the Division and shall be reported to the Bureau of Water Allocation.

7. The pumping equipment capacity shall not be increased without prior approval by the Division.

8. All new services shall be metered upon installation.

9. The applicant shall adopt and implement to the satisfaction of the Division, a continuous program to encourage water conservation in all types of use within the area served by the applicant. A report shall be submitted to the Division on or before October 31, 1985, and each year thereafter, on the actions taken pursuant to this program and the impact thereof.

10. Permittee shall have the right to apply at any time for modification of this permit by submission of the appropriate application forms. Permittee may informally discuss the terms and conditions of this permit at any time with the Bureau of Water Allocation. An application for renewal shall be filed 3 months prior to the expiration date.

11. If the permittee fails to comply with any of the terms and conditions herein, or in the public interest and after due process, this approval may be reviewed for possible modification or revocation thereof.

12. The Division, at its option, may cause the permit to be reviewed at intervals of not less than 5 years to examine the need for the allocation and to determine compliance with the terms and conditions of the permit and whether a modification to the permit is necessary.

13. The permittee is subject to such initial, renewal and annual fees as may be

[illegible]

14. [illegible] Delaware River Basin Commission which may be required under the provisions of the Delaware River Basin Compact.

15. The applicant shall adopt and be prepared to implement to the satisfaction of the Division, a drought or other water supply emergency plan. The plan shall be submitted within 90 days of issuance of this permit.

16. The applicant shall monitor all water supply facilities including storage and distribution systems for leakage.

17. This permit shall expire on June 30, 2000.

18. This permit shall not become operative unless and until the applicant has filed with the Division within 60 days from the date of transmittal hereof, written acceptance of the terms and conditions hereby imposed.

Respectfully submitted,

Diane E. Hart

Diane E. Hart
Bureau of Water Allocation

7-15-85
EH
OK WCL
7/17

REFERENCE NO. 15

STAFF REPORT

In the matter of	Application No. 2213P to renew permit to divert water from three wells in the City of Millville, Cumberland County
Kerr Glass Manufacturing Corp.	

In compliance with the provisions of N.J.S.A. 58:1A-1 et seq., Kerr Glass Manufacturing Corp., P.O. Box 150, Millville, New Jersey, filed an application with the Division of Water Resources on March 4, 1982 for a renewal permit to divert a maximum of 55.16 million gallons of water during any month, at a maximum rate of 1300 gallons per minute from existing Wells No. 1, 2 and 3, 140 feet deep, in the Cohansey formation. The wells are located 3000 feet south of Route 49, between Route 47 and Maurice River, in the City of Millville, Cumberland County.

Diversion is in the Delaware River Basin.

The applicant requests no change in their existing diversion rights and no public notice is required.

Background

1. This permit is a renewal of an allocation granted by the following:

Permit No.	Date	Source of Water	Diversion (mg)
P-788	11/16/70	Cohansey	56.16/month

2. The diversion includes the following::

Well No.	Date Constr.	Well Permit No.	Depth (ft.)	Pump Cap. gpm	Yield gpm
1	1958	35-718	115	400	450
2	1958	35-719	108	400	550
3	1958	35-720	140	500	610

3. The diversion is used for industrial supply.

4. Applicant's request will decrease or increase existing allocation.

Findings of Fact

1. A review of quarterly diversion reports indicates the following

water use:

Source	Maximum Monthly Use	Average Monthly Use	Allocation
Cohansey	33.25 (1981)	23.0	55.16

The applicant states that decreased demand is due to economic recession and as soon as economic recovery takes place, the demand will rise again.

2. The following static water level data is available:

Well No.	Well Permit No.	Static Water Levels (below well head) When Constructed	Recent dates
1	35-718	0	none available
2	35-719	17	none available
3	35-720	20	none available

3. The following long-term pump test data is available:

Well No.	Date of Test	Yield (gpm)	Drawdown (feet)	Static Level (feet)	Pumping time (hours)
3	4/20/58	610	38	20	12

4 Public water supply wells within a 5-mile radius include the following:

Well Owner	Well No.	Well Permit No.	Depth (feet)	Capacity (gpm)	Distance (feet)
Millville	1	35-841	140	400	1200

5. Water, after use, will be discharged to Kerr Glass Manufacturing Corporation treatment plant for treatment and discharge to Maurice River under NJPDES Permit No. 005398. The treatment works are not under a sewer connection ban or other restriction imposed by NJDEP.

Staff Analysis

1. The water use is reasonable and in the public interest.

2. Based on the pump tests listed above, the radius of influence is calculated as follows:

Well No.	T(gpd/feet)	S	t(days)	q(gpm)	Radius(feet)
3	20,000	0.2	1/2	610	100

3. The diversion probably will not have an adverse effect on nearby

wells because the nearest public supply well is 1200 feet and the cone of depression extends to only 100 feet.

4. No data exists to make a determination as to the state of natural replenishment of the groundwater, however, because the Cohansey is a prolific water source it is assumed that natural replenishment is taking place. Static water level reports should be required as a condition of this permit.

5. Diversion will not be likely to cause ground water pollution because there is no landfill or other sources of pollution near the diversion.

6. There is little probability of salt water intrusion because the diversion is in water table aquifer. Also diversion is located several miles inland.

Conclusions

1. The allocation is necessary and in the public interest.

2. The diversion will not cause groundwater pollution or salt water intrusion.

3. The diversion is not expected to exceed natural replenishment, and will not unduly interfere with other users.

Recommendations

Issuance of the permit is recommended subject to the standard conditions and to the following specific conditions:

1. The amount of water that may be diverted under this renewal permit shall be as follows:

Well Permit No.	Well Name Or Designation	Pump Cap. gpm	Formation
35-718	1	400	Cohansey
35-719	2	400	Cohansey
35-720	3	500	Cohansey

2. The total allocation from the above sources shall not exceed 55.16 million gallons per month at a maximum rate of 1300 gpm.

3. All wells shall be metered. The total diversion for each month from each formation shall be reported quarterly to the Water Allocation Office. Applicant shall submit by September 30, 1983 a plan for monitoring diversions using the form or format available from the Water Allocation Office. Wells shall be equipped with a tag showing the well permit numbers listed above.

4. Well shall be contructed so that water level measurements can be made by tape at any time. Applicant shall submit, with quarterly diversion, the static water level in all wells identified in the monitoring plan (See 3 above). Measurement shall be made when the well pump has been shut down for a recovery period of 12 to 24 hours. For wells that operate continuously, a monitoring schedule will be proposed in the monitoring plan for review and approval by the Water Allocation Office.

5. The pumping equipment capacity shall not be increased without prior approval by the Division.

6. Permittee shall have the right to apply at any time for modification of this permit by submission of the appropriate application forms. Permittee may informally discuss the terms and conditions of this permit at any time with the Water Allocation Office. An application for renewal shall be filed 3 months prior to the expiration date.

7. If the permittee fails to comply with any of the terms and conditions herein, or in the public interest and after due process this approval may be reviewed for possible modification or revocation thereof.

8. The Division, at its option, may cause the permit to be reviewed at intervals of not less than 5 years to examine the need for the allocation and to determine compliance with the terms and conditions of the permit and whether a modification to the permit is necessary.

9. The permittee is subject to such initial, renewal and annual fees as may be prescribed by the regulations.

10. Approval of this application is subject to the granting of any approval by the Delaware River Basin Commission which may be required under the provisions of the Delaware River Basin Compact.

11. This permit shall expire on June 30, 1998.

12. This permit shall not become operative unless and until the applicant has filed with the Division within 60 days from the date of transmittal hereof, written acceptance of the terms and conditions hereby imposed.

Respectfully submitted,

OK [illegible]
ETN

Aziz Syed
Aziz Syed
Water Allocation Office

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

Permit No. 25-713
Application No.
County

WELL RECORD

1. OWNER Armstrong Cork Co. ADDRESS Millville, N.J.
   Owner's Well No. 11 SURFACE ELEVATION ______ Feet (Above mean sea level)
2. LOCATION Millville, N.J.
3. DATE COMPLETED Aug. 1958 DRILLER Artesian Well Drilling Co.
4. DIAMETER: top 10 Inches Bottom 10 Inches TOTAL DEPTH 115 Feet
5. CASING: Type Steel Diameter 10 Inches Length 80'9" Feet
6. SCREEN: Type Cook Everdure W.W. Size of Opening #40 Diameter 9½ O.D. Inches Length 31'5" Feet
   Range Top 81 Feet, Bottom 112 Feet
   Geologic Formation ______
   Top 8" piece 3'3"
   Tail piece. Diameter 8 Inches Length 4'5" Feet
7. WELL FLOWS NATURALLY ______ Gallons per Minute at ______ Feet above surface
   Water rises to ______ Feet above surface
8. RECORD OF TEST: Date Aug 3, 1958 Yield 450 Gallons per minute
   Static water level before pumping grade 0 Feet below surface
   Pumping level 40 feet below surface after 8 hours pumping
   Drawdown 40 Feet Specific Capacity 10+ Gals. per min. per ft. of drawdown
   How Pumped air compressor How measured weir
   Observed effect on nearby wells none
9. PERMANENT PUMPING EQUIPMENT:
   Type Worthington deep well turbine Mfrs. Name Worthington ✓
   Capacity 500 ✓ G.P.M. How Driven electric H.P. 40 ✓ R.P.M. 1750
   Depth of Pump in well 65 Feet ______ Depth of Footpiece in well ______ Feet
   Depth of Air Line in well 66 Feet ______ Depth of Meter on Pump Sparling 6" Inline 000854(00)
10. USED FOR commercial purposes AMOUNT Average ______ Gallons Daily
    Inspection CDG -7-15-70
    Maximum ______ Gallons Daily
11. QUALITY OF WATER [illegible] Sample: Yes ______ No. ______
    Taste none Odor [illegible] Color clear Temp. ______ °F
12. LOG [illegible] Are samples available [illegible]
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA [illegible] Drilling Co.
14. DATA OBTAINED BY [illegible] Jr. Date [illegible]

NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, location map, sketch of special casing arrangements etc.)

37-10a

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

Permit No. [illegible]
Application No.
County

WELL RECORD

1. OWNER Armstrong Cork Co. ADDRESS Millville, N.J.

Owner's Well No. #2 SURFACE ELEVATION ______ Feet (Above mean sea level)

2. LOCATION Millville, N.J.

3. DATE COMPLETED Aug. 1958 DRILLER [illegible] WELL DRILLING CO.

4. DIAMETER: top 10 Inches Bottom 10 Inches TOTAL DEPTH 144 Feet

5. CASING: Type steel Diameter 10 Inches Length 103 Feet

6. SCREEN: Type Cook everdure W.W. Size of Opening #40 Diameter 9 O.D. Inches Length 31'5" Feet

Range Top 108 Feet, Bottom 142 Feet

Geologic Formation

8" top pipe and packer 3'4"

Tail piece. Diameter 8 Inches Length 4 Feet

7. WELL FLOWS NATURALLY ______ Gallons per Minute at ______ Feet above surface

Water rises to ______ Feet above surface

8. RECORD OF TEST: Date Aug. 11, 1958 Yield 550 Gallons per minute

Static water level before pumping 17 Feet below surface

Pumping level 47 feet below surface after 8 hours pumping

Drawdown 30 Feet Specific Capacity 18 Gals. per min. per ft. of drawdown

How Pumped air compressor How measured weir

Observed effect on nearby wells lowered well #1 about 18"

9. PERMANENT PUMPING EQUIPMENT:

Type ~~[illegible]~~ Subm. Mfrs. Name ~~[illegible]~~ Pfluegor

Capacity 500 G.P.M. How Driven electric H.P. 40 R.P.M. 1750

Depth of Pump in well 85 Feet Depth of Footpiece in well 90 Feet

Depth of Air Line in well ______ Feet Depth of Meter on Pump On Order

10. USED FOR commercial purposes AMOUNT Average ______ Gallons Daily

Inspection - CDG - 7-15-70

Maximum ______ Gallons Daily

11. QUALITY OF WATER excellent Sample: Yes x No. ______

Taste good Odor none Color clear Temp. ______ °F

12. LOG [illegible] Are samples available no

(Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)

13. SOURCE OF DATA

14. DATA OBTAINED BY ______ Date ______

(NOTE: Use other side of this sheet for additional information such as log of materials penetrated, analysis of the water, sketch map, sketch of special casing arrangements etc.)

DEPARTMENT OF CONSERVATION
AND ECONOMIC DEVELOPMENT
DIVISION OF WATER POLICY & SUPPLY

Permit No. 35-[illegible]
Application No. ______
County ______

WELL RECORD

1. OWNER Armstrong Cork Co. ADDRESS Millville, N.J.
   Owner's Well No. Well #3 SURFACE ELEVATION ______ Feet (Above mean sea level)
2. LOCATION Millville, N.J.
3. DATE COMPLETED Aug. 20, 1958 DRILLER [illegible] WELL DRILLING CO.
4. DIAMETER: top 10 Inches Botton 10 Inches TOTAL DEPTH 140 Feet
5. CASING: Type steel Diameter 10 Inches Length 104 Feet
6. SCREEN: Type Cook Everdure N.J. Size of Opening #40 Diameter 9 [illegible] O.D. Inches Length 31'2" Feet
   Range { Top 105 Feet Geologic Formation ______
   Bottom 136 Feet
   Tail piece. Diameter 8 Inches Length 3'10" Feet
   8" top pipe w/packer 4'3"
7. WELL FLOWS NATURALLY ______ Gallons per Minute at ______ Feet above surface
   Water rises to ______ Feet above surface
8. RECORD OF TEST: Date Aug. 25, 1958 Yield 610 Gallons per minute
   Static water level before pumping 19'7" Feet below surface
   Pumping level 58 feet below surface after 12 hours pumping
   Drawdown 38 Feet Specific Capacity 16 Gals. per min. per ft. of drawdown
   How Pumped air compressor How measured weir
   Observed effect on nearby wells lowered #1 well and #2 well several inches
9. PERMANENT PUMPING EQUIPMENT:
   Type ~~Deep Well Turbine~~ Mfrs. Name ~~[illegible]~~ Gasoline Engine
   Capacity 500 G.P.M. How Driven gasoline H.P. ? R.P.M. 1750
   Depth of Pump in well 85 Feet ______ Depth of Footpiece in well ______ Feet
   Depth of Air Line in well 90 Feet ______ Depth of Meter on Pump On Order
10. USED FOR Standby commercial purposes AMOUNT Average ______ Gallons Daily
    emergency use only
    Maximum ______ Gallons Daily

Inspection: CDG 7-15-70

11. QUALITY OF WATER good Sample: Yes ____ No. ____
    Taste good Odor none Color clear Temp. ______ °F
12. LOG see other side Are samples available no
    (Give details on back of sheet or on separate sheet. If electric log was made, please furnish copy)
13. SOURCE OF DATA [illegible] CO.
14. DATA OBTAINED BY [illegible] Jr. Date Dec. 1958

(NOTE: Use other side of this sheet for additional information such as log of materials penetrat[ed], analysis of the water, sketch map, sketch of special casing arrangements etc.)

REFERENCE NO. 16

NUS CORPORATION
SUPERFUND DIVISION

PROJECT NOTES

TO: Aircraft Painting, Inc. File

DATE: August 29, 1988

FROM: Joann Wagner

COPIES:

SUBJECT: Records of wells within a 3-mile radius of site

REFERENCE: Atlas Sheet No. 35 and corresponding Water Supply Overlay

During visits by this writer to the NJDEP, Div. of Water Resources, Bureau of Water Allocation (401 E. State Street, Trenton) on August 22 and 26, 1988, copies were made from microfilm of well records for wells within a 3-mile radius of the Aircraft Painting, Inc. site. The wells were determined to be within this radius using the New Jersey rectangular coordinate system for Atlas Sheet No. 35. From these well records it was found that there are at least 58 domestic wells and 4 irrigation wells within a 3-mile radius of the Aircraft Painting, Inc. site which are not listed on the printout obtained from the same DEP office of Water Withdrawal Points within a 5-mile radius of the site. Copies of these well records can be found in the Reference Information subsection of the Aircraft Painting, Inc. TDD No. 02-8805-04 file; they are too voluminous to be included with the Site Inspection Report.

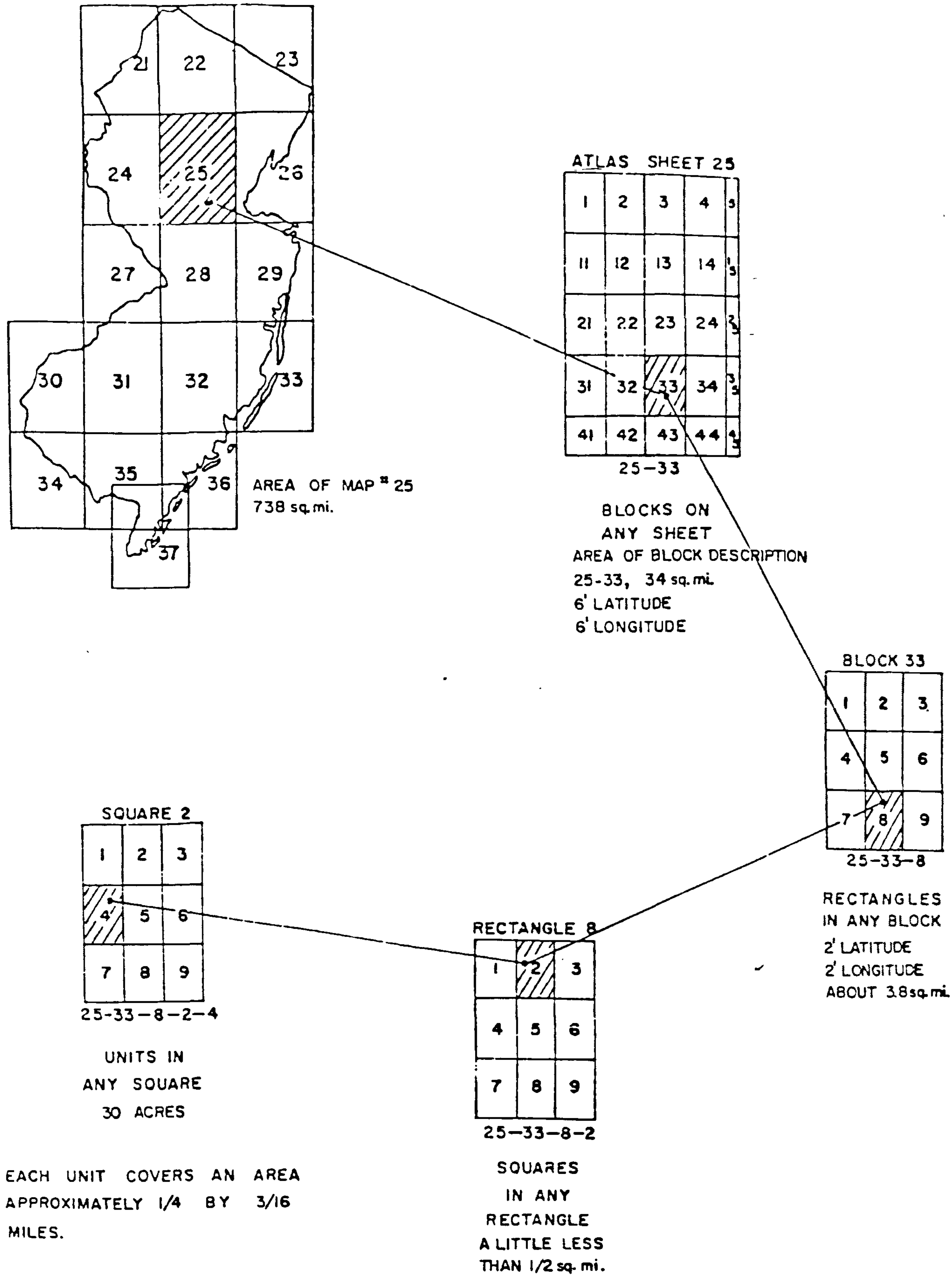
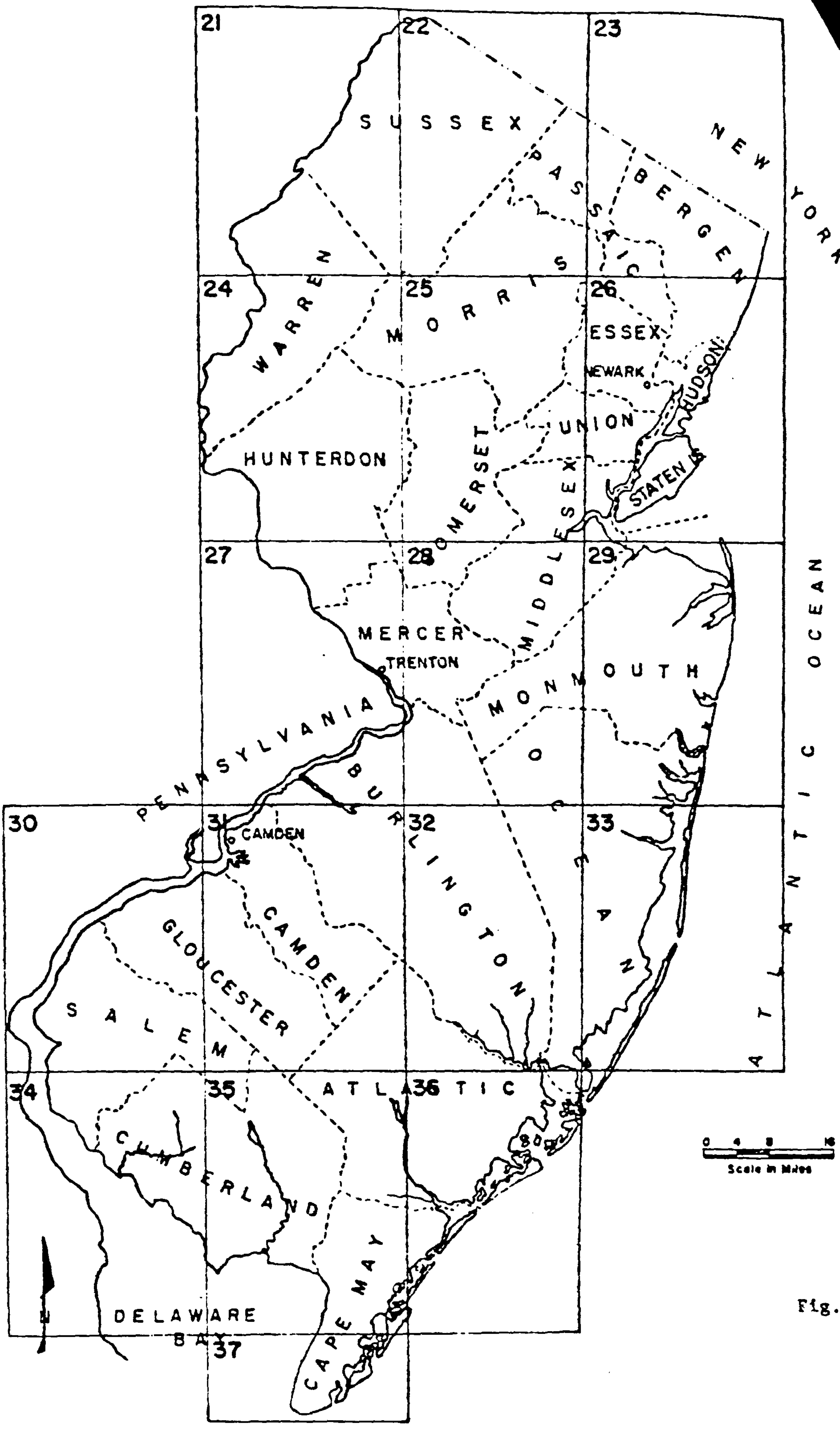


DIAGRAM SHOWING USE OF NEW JERSEY RECTANGULAR COORDINATE SYSTEM. TO LOCATE A FACILITY AT 25-33-8-2-4

Fig. 2



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SUSSEX
NEW YORK
PASSAIC
BERGEN
WARREN
MORRIS
ESSEX
NEWARK
HUDSON
UNION
STATEN IS.
HUNTERDON
SOMERSET
MIDDLESEX
MERCER
TRENTON
MONMOUTH
OCEAN
ATLANTIC OCEAN
PENNSYLVANIA
BURLINGTON
CAMDEN
GLOUCESTER
SALEM
ATLANTIC
CUMBERLAND
CAPE MAY
DELAWARE BAY
0 4 8 16
Scale in Miles

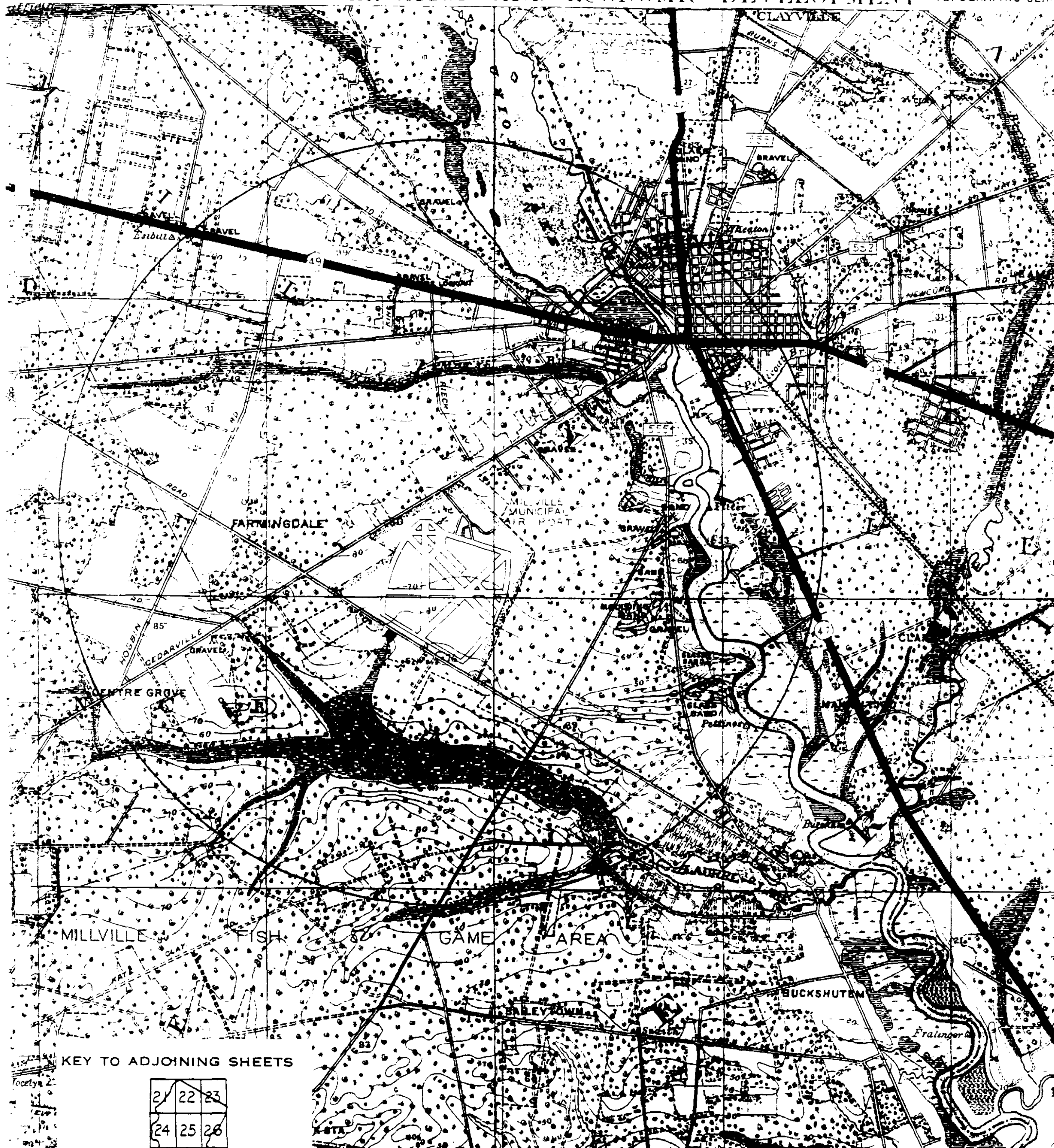
Fig.1

STATE OF NEW JERSEY

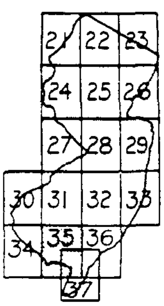
DEPARTMENT OF CONSERVATION AND ECONOMIC DEVELOPMENT

SHEET 35

TOPOGRAPHIC SERI



KEY TO ADJOINING SHEETS



Scale: 1 Mile to an Inch

Miles

1 3/4 1/2 1/4 0 1 2 3

Yards

1000 500 0 1000 2000 3000

Meters

1000 500 0 1000 2000 3000

CONTOUR INTERVAL: 10 FEET (5 FEET IN SOUTHWESTERN PART)

A. HOEN & CO. BALTIMORE, MD

LEGEND

AREA SERVED BY PRIVATE WATER SERVICE COMPANIES

AREA SERVED BY REGIONALLY OWNED WATER SERVICE COMPANIES

AREA SERVED BY MUNICIPALLY OWNED WATER SERVICE COMPANIES

AREA NOT PRESENTLY SERVED BY WATER SERVICE

PUBLIC SUPPLY WELLS

SURFACE WATER INTAKE

—W— MAJOR WATER MAINS

TOWNSHIP BOUNDARIES

COUNTY BOUNDARIES

STATE BOUNDARIES

ALL MAP COORDINATES ARE FOR THE LOWER LEFT HAND CORNER

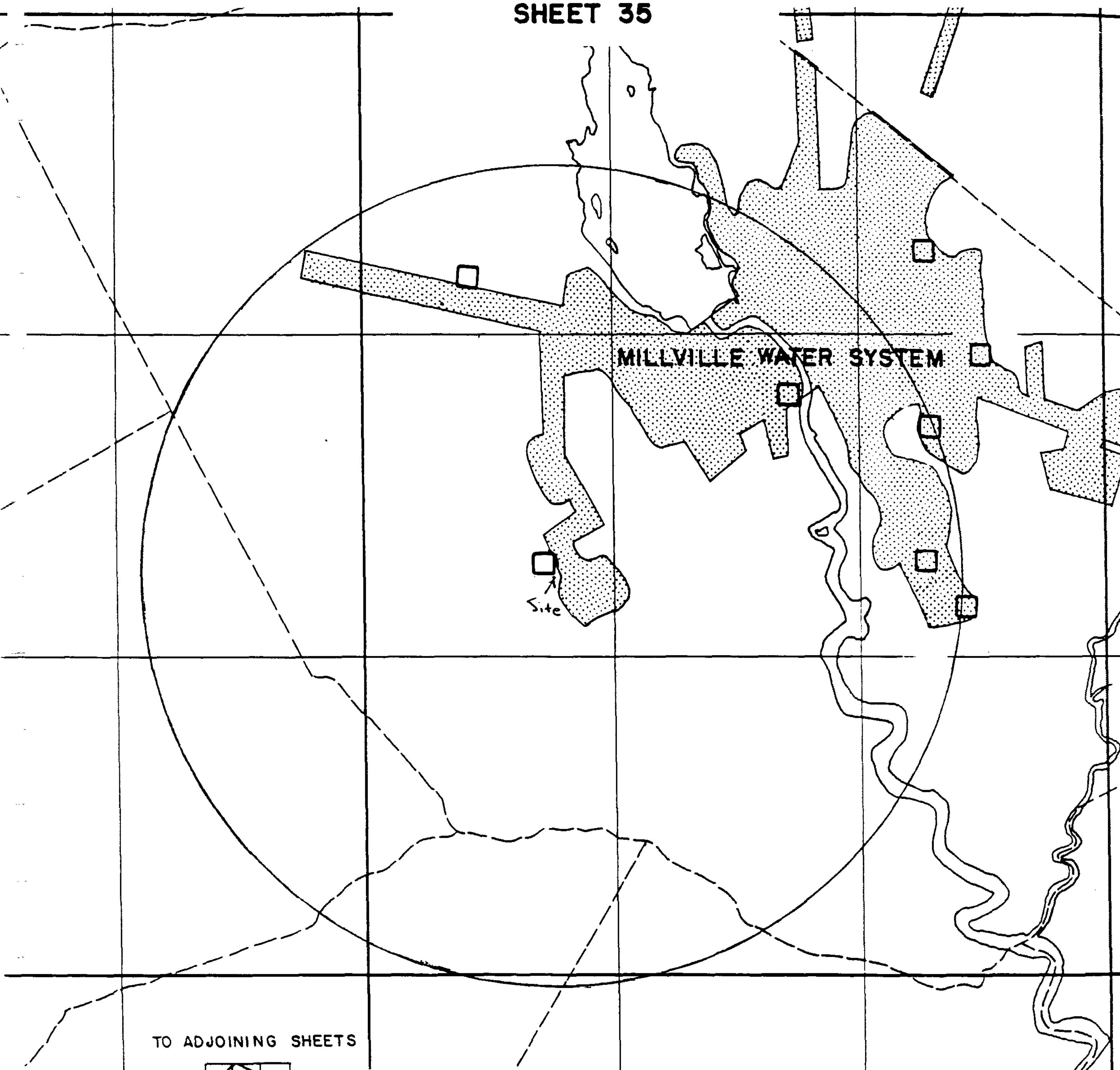
LOCATIONS AND OWNERS OF PUBLIC SUPPLY WELLS

35-02-515	City of Vineland
35-02-517	City of Vineland
35-02-633	City of Vineland
35-02-684	City of Vineland
35-02-953	City of Vineland
35-02-956	City of Vineland
35-03-227	Our Ladies of Victories School
35-03-434	City of Vineland
35-12-184	City of Millville
35-12-373	City of Millville
35-12-491	City of Millville
35-12-534	City of Millville
35-12-619	City of Millville
35-12-622	City of Millville
35-12-673	City of Millville
35-12-684	City of Millville
35-21-795	Fortesque Tract Water System
35-22-646	Haleyville Elementary School
35-22-868	Commercial Twp. Board of Education
35-23-875	State of New Jersey
35-23-875	State of New Jersey
35-24-982	Woodbine Water Co.
35-24-986	Woodbine Water Co.
35-34-333	Woodbine State Hospital
35-44-641	Neptune Water Co.
35-44-653	Neptune Water Co.
35-44-653	Neptune Water Co.

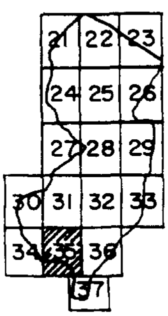
SURFACE WATER INTAKES

None Available - 11/75

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
WATER SUPPLY OVERLAY
SHEET 35



TO ADJOINING SHEETS



Scale: 1: 63,360

Kilometers: 1 ½ 0 1 2 3

Miles: 1 ¾ ½ ¼ 0 1 2 3

SUPERVISED BY GEORGE J. HALASI-KUN, TOPOGRAPHIC ENGINEER
DRAFTED BY JOHN F. OLSCHEWSKI

ANY CORRECTIONS OR ADDITIONAL INFORMATION WILL BE APPRECIATED

REFERENCE NO. 17

Surface Water Classifications

Surface Water Quality Standards

N.J.A.C. 7:9-4

May 1985

State of New Jersey Department of Environmental Protection/Division of Water Resources

boundaries of the Wildlife Management Area	
(Mad Horse Creek) - Creek and all waters within the Mad Horse Creek Wildlife Management Area	FW2-NT/SE1(C1)
MALAPATIS CREEK	
(Mad Horse Creek) - Entire length, except segment described below	SE1(C1)
(Mad Horse Creek) - Portions of the Creek beyond the boundaries of the Mad Horse Creek Wildlife Management Area	SE1
MANANTICO CREEK	
(Millville) - Entire length, except segment described below	FW2-NT
(Menantico) - Segment within the boundaries of the Menantico Ponds Wildlife Management Area	FW2-NT(C1)
MANTUA CREEK (Woodbury) - Entire length	FW2-NT/SE2
MARCIA LAKE (Montague)	FW2-TM(C1)
MASON CREEK	
(Springville) - Entire length, except segment described below	FW2-NT
(Medford) - Segment within Medford Wildlife Management Area	FW2-NT(C1)
MASONS RUN	
(Pine Hill) - Source to Little Mill Rd.	FW2-TP(C1)
(Lindenwold) - Little Mill Rd. to confluence with Big Timber Creek	FW2-NT
MAURICE RIVER	
MAIN STEM	
(Willow's Grove) - Source to the boundary of the section of Union Lake Wildlife Management Area north of Vineland	FW2-NT
(Vineland) - Boundary of the Union Lake Wildlife Management Area to confluence with Blackwater Branch	FW2-NT(C1)
(Vineland) - Confluence with Blackwater Branch to Delaware Bay, except tributaries described under Tributaries below	FW2-NT/SE1
TRIBUTARIES, MAURICE RIVER	
(Willow's Grove) - Those portions of tributaries that are within the boundaries of the Pinelands Protection and Preservation Area	PL
(Vineland) - All tributaries within the boundaries of the Union Lake Wildlife Management Area and within the Wildlife Management Area that borders Delaware Bay	FW2-NT/SE1(C1)
MCCORMICK POND (Egg Island)	FW2-NT/SE1(C1)

REFERENCE NO. 18

Surface Water Quality Standards

SURFACE WATER QUALITY STANDARDS

N.J.A.C. 7:9-4.1 et seq.

May 1985

New Jersey Department of Environmental Protection/Division of Water Resources

(c) In all FW2 waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;

2. Primary and secondary contact recreation;

3. Industrial and agricultural water supply;

4. Public potable water supply after such treatment as required by law or regulation; and

5. Any other reasonable uses.

(d) In all SE1 waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;

2. Maintenance, migration and propagation of the natural and established biota;

3. Primary and secondary contact recreation; and

4. Any other reasonable uses.

(e) In all SE2 waters the designated uses are:

1. Maintenance, migration and propagation of the natural and established biota;

2. Migration of diadromous fish;

3. Maintenance of wildlife;

4. Secondary contact recreation; and

5. Any other reasonable uses.

(f) In all SE3 waters the designated uses are:

1. Secondary contact recreation;

2. Maintenance and migration of fish populations;

3. Migration of diadromous fish;

4. Maintenance of wildlife; and

5. Any other reasonable uses.

(g) In all SC waters the designated uses are:

1. Shellfish harvesting in accordance with N.J.A.C. 7:12;

REFERENCE NO. 19

ENDANGERED AND THREATENED

WILDLIFE AND PLANTS

JANUARY 1, 1986

50 CFR 17.11 and 17.12

Department of the Interior
U.S. Fish and Wildlife Service

Title 50—Wildlife and Fisheries

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

. . . . .

Subpart B—Lists

Source: 48 FR 34182, July 27, 1983, unless otherwise noted.

§ 17.11 Endangered and threatened wildlife.

(a) The list in this section contains the names of all species of wildlife which have been determined by the Services to be Endangered or Threatened. It also contains the names of species of wildlife treated as Endangered or Threatened because they are sufficiently similar in appearance to Endangered or Threatened species (see § 17.50 *et seq.*).

(b) The columns entitled "Common Name," "Scientific Name," and "Vertebrate Population Where Endangered or Threatened" define the species of wildlife within the meaning of the Act. Thus, differently classified geographic populations of the same vertebrate subspecies or species shall be identified by their differing geographic boundaries, even though the other two columns are identical. The term "Entire" means that all populations throughout the present range of a vertebrate species are listed. Although common names are included, they cannot be relied upon for identification of any specimen, since they may vary greatly in local usage. The Services shall use the most recently accepted scientific name. In cases in which confusion might arise, a synonym(s) will be provided in parentheses. The Services shall rely to the extent practicable on the *International Code of Zoological Nomenclature.*

(c) In the "Status" column the following symbols are used: "E" for Endangered, "T" for Threatened, and "E [or T] (S/A)" for similarity of appearance species.

(d) The other data in the list are nonregulatory in nature and are provided for the information of the reader. In the annual revision and compilation of this Title, the following information may be amended without public notice: the spelling of species' names, historical range, footnotes, references to certain other applicable portions of this Title, synonyms, and more current names. In any of these revised entries, neither the species, as defined in paragraph (b) of this section, nor its status may be changed without following the procedures of Part 424 of this Title.

(e) The "Historic Range" indicates the known general distribution of the species or subspecies as reported in the current scientific literature. The present distribution may be greatly reduced from this historic range. This column does not imply any limitation on the application of the prohibitions in the Act or implementing rules. Such prohibitions apply to all individuals of the species, wherever found.

(f)(1) A footnote to the Federal Register publication(s) listing or reclassifying a species is indicated under the column "When Listed." Footnote numbers to §§ 17.11 and 17.12 are in the same numerical sequence, since plants and animals may be listed in the same Federal Register document. That document, at least since 1973, includes a statement indicating the basis for the listing, as well as the effective date(s) of said listing.

(2) The "Special Rules" and "Critical Habitat" columns provide a cross reference to other sections in Parts 17, 222, 226, or 227. The "Special Rules" column will also be used to cite the special rules that describe experimental populations and determine if they are essential or nonessential. Separate listing will be made for experimental populations, and the status column will include the following symbols: "XE" for an essential experimental population and "XN" for a nonessential experimental population. The term "NA" (not applicable) appearing in either of these two columns indicates that there are no special rules and/or critical habitat for that particular species. However, all other appropriate rules in Parts 17, 217–227, and 402 still apply to that species. In addition, there may be other rules in this Title that relate to such wildlife, e.g., port-of-entry requirements. It is not intended that the references in the "Special Rules" column list all the regulations of the two Services which might apply to the species or to the regulations of other Federal agencies or State or local governments.

(g) The listing of a particular taxon includes all lower taxonomic units. For example, the genus *Hylobates* (gibbons) is listed as Endangered throughout its entire range (China, India, and SE Asia); consequently, all species, subspecies, and populations of that genus are considered listed as Endangered for the purposes of the Act. In 1978 (43 FR 6230–6233) the species *Haliaeetus leucocephalus* (bald eagle) was listed as Threatened in "USA (WA, OR, MN, WI, MI)" rather than its entire population; thus, all individuals of the bald eagle found in those five States are considered listed as Threatened for the purposes of the Act.

(h) The "List of Endangered and Threatened Wildlife" is provided below:

EDITORIAL NOTE: This is a compilation and special reprint of 50 CFR 17.11 and 17.12 and is current as of the date shown on the cover. Minor changes and corrections to the October 1, 1988, compilation of 50 CFR have been incorporated in this printing, as well as all published final rules that have subsequen. appeared in the Federal Register. Otherwise, no entry in these lists has been significantly affected. This list has been prepared by the staff of the Office of Endangered Species, U.S. Fish and Wildlife Service, Washington, D.C. 20240. Readers are requested to advise the Service of any errors in this list. Copies are available from the Publication Unit, U.S. Fish and Wildlife Service, Washington, D.C. 20240.

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
MAMMALS							
Anoa, lowland	*Bubalus depressicornis* (= *B. anoa depressicornis*).	Indonesia	Entire	E	3	NA	NA
Anoa, mountain	*Bubalus quarlesi* (= *B. anoa quarlesi*)	do	do	E	15	NA	NA
Antelope, giant sable	*Hippotragus niger variani*	Angola	do	E	15	NA	NA
Argali	*Ovis ammon hodgsoni*	China (Tibet, Himalayas)	do	E	15	NA	NA
Armadillo, giant	*Priodontes maximus* (= *giganteus*)	Venezuela and Guyana to Argentina	do	E	15	NA	NA
Armadillo, pink fairy	*Chlamyphorus truncatus*	Argentina	do	E	3	NA	NA
Ass, African wild	*Equus asinus* (= *africanus*)	Somalia, Sudan, Ethiopia	do	E	3	NA	NA
Ass, Asian wild (= kulan, onager)	*Equus hemionus*	Southwestern and Central Asia	do	E	3	NA	NA
Avahi	*Avahi* (= *Lichanotus*) *laniger* (= entire genus).	Malagasy Republic (= Madagascar)	do	E	3	NA	NA
Aye-Aye	*Daubentonia madagascariensis*	Malagasy Republic (= Madagascar)	do	E	3	NA	NA
Babirusa	*Babyrousa babyrussa*	Indonesia	do	E	15	NA	NA
Baboon, gelada	*Theropithecus gelada*	Ethiopia	do	T	16	NA	17.40(c)
Bandicoot, barred	*Perameles bougainville*	Australia	do	E	4	NA	NA
Bandicoot, desert	*Perameles eremiana*	do	do	E	6	NA	NA
Bandicoot, lesser rabbit	*Macrotis leucura*	do	do	E	4	NA	NA
Bandicoot, pig-footed	*Chaeropus ecaudatus*	do	do	E	4	NA	NA
Bandicoot, rabbit	*Macrotis lagotis*	do	do	E	4	NA	NA
Banteng	*Bos javanicus* (= *banteng*)	Southeast Asia	do	E	3	NA	NA
Bat, Bulmer's fruit (flying fox)	*Aproteles bulmerae*	Papua New Guinea	do	E	139	NA	NA
Bat, bumblebee	*Craseonycteris thonglongyai*	Thailand	do	E	139	NA	NA
Bat, gray	*Myotis grisescens*	Central and Southeastern U.S.A.	do	E	13	NA	NA
Bat, Hawaiian hoary	*Lasiurus cinereus semotus*	U.S.A. (HI)	do	E	2	NA	NA
Bat, Indiana	*Myotis sodalis*	Eastern and Midwestern U.S.A.	do	E	1	17.95(a)	NA
Bat, little Mariana fruit	*Pteropus tokudae*	Western Pacific Ocean: U.S.A. (Guam)	do	E	156	NA	NA
Bat, Mariana fruit	*Pteropus mariannus mariannus*	Western Pacific Ocean: U.S.A. (Guam, Rota, Tinian, Saipan, Agiguan).	Guam	E	156	NA	NA
Bat, Ozark big-eared	*Plecotus townsendii ingens*	U.S.A. (MO, OK, AR)	do	E	85	NA	NA
Bat, Rodrigues fruit (flying fox)	*Pteropus rodricensis*	Indian Ocean: Rodrigues Island	do	E	139	NA	NA
Bat, Singapore roundleaf horseshoe	*Hipposideros ridleyi*	Malaysia	do	E	139	NA	NA
Bat, Virginia big-eared	*Plecotus townsendii virginianus*	U.S.A. (KY, WV, VA)	do	E	85	17.95(a)	NA
Bear, brown	*Ursus arctos pruinosus*	China (Tibet)	do	E	15	NA	NA
Bear, brown	*Ursus arctos arctos*	Palearctic	Italy	E	15	NA	NA
Bear, brown or grizzly	*Ursus arctos* (= *U.a. horribilis*)	Holarctic	U.S.A.—48 conterminous States.	T	1, 2, 9	NA	17.40(b)
Bear, brown or grizzly	*Ursus arctos* (= *U.a. nelsoni*)	Holarctic	Mexico	E	3	NA	NA
Beaver	*Castor fiber birulai*	Mongolia	Entire	E	15	NA	NA
Bison, wood	*Bison bison athabascae*	Canada, Northwestern U.S.A.	Canada	E	3	NA	NA
Bobcat	*Felis rufus escuinapae*	Central Mexico	Entire	E	15	NA	NA
Bontebok (antelope)	*Damaliscus dorcas dorcas*	South Africa	do	E	15	NA	NA
Camel, Bactrian	*Camelus bactrianus* (= *ferus*)	Mongolia, China	do	E	15	NA	NA

Species: Common name	Species: Scientific name	Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Caribou, woodland	*Rangifer tarandus caribou*	Canada, U.S.A. (AK, ID, ME, MI, MN, MT, NH, VT, WA, WI).	Canada (that part of S.E. Brit. Col. bounded by the Can.-USA border, Columbia R., Kootenay R., Kootenay L., and Kootenai R.), U.S.A. (ID, WA).	E	128E, 136E, 143	NA	NA
Cat, Andean	*Felis jacobita*	Chile, Peru, Bolivia, Argentina	Entire	E	15	NA	NA
Cat, black-footed	*Felis nigripes*	Southern Africa	do	E	15	NA	NA
Cat, flat-headed	*Felis planiceps*	Malaysia, Indonesia	do	E	15	NA	NA
Cat, Iriomote	*Felis (Mayailurus) iriomotensis*	Japan (Iriomote Island, Ryukyu Islands)	do	E	50	NA	NA
Cat, leopard	*Felis bengalensis bengalensis*	India, Southeast Asia	do	E	15	NA	NA
Cat, marbled	*Felis marmorata*	Nepal, Southeast Asia, Indonesia	do	E	15	NA	NA
Cat, Pakistan sand	*Felis margarita scheffeli*	Pakistan	do	E	139	NA	NA
Cat, Temminck's (= golden cat)	*Felis temmincki*	Nepal, China, Southeast Asia, Indonesia (Sumatra).	do	E	15	NA	NA
Cat, tiger	*Felis tigrinus*	Costa Rica to northern Argentina	do	E	5	NA	NA
Chamois, Apennine	*Rupicapra rupicapra ornata*	Italy	do	E	15	NA	NA
Cheetah	*Acinonyx jubatus*	Africa to India	do	E	3, 5	NA	NA
Chimpanzee	*Pan troglodytes*	West and Central Africa	do	T	16	NA	17.40(c)
Chimpanzee, pygmy	*Pan paniscus*	Zaire	do	T	16	NA	17.40(c)
Chinchilla	*Chinchilla brevicaudata boliviana*	Bolivia	do	E	15	NA	NA
Civet, Malabar large-spotted	*Viverra megaspila civettina*	India	do	E	50	NA	NA
Cochito (= Gulf of California harbor porpoise).	*Phocoena sinus*	Mexico (Gulf of California)	do	E	169	NA	NA
Colobus, Preuss's red	*Colobus badius preussi*	Cameroon	do	E	139	NA	NA
Cougar, eastern	*Felis concolor couguar*	Eastern North America	do	E	6	NA	NA
Deer, Bactrian	*Cervus elaphus bactrianus*	U.S.S.R., Afghanistan	do	E	50	NA	NA
Deer, Bawean	*Axis (= Cervus) porcinus kuhli*	Indonesia	do	E	3	NA	NA
Deer, Barbary	*Cervus elaphus barbarus*	Morocco, Tunisia, Algeria	do	E	50	NA	NA
Deer, Cedros Island mule	*Odocoileus hemionus cedrosensis*	Mexico (Cedros Island)	do	E	10	NA	NA
Deer, Columbian white-tailed	*Odocoileus virginianus leucurus*	U.S.A. (WA, OR)	do	E	1	NA	NA
Deer, Corsican red	*Cervus elaphus corsicanus*	Corsica, Sardinia	do	E	50	NA	NA
Deer, Eld's brow-antlered	*Cervus eldi*	India to Southeast Asia	do	E	3	NA	NA
Deer, Formosan sika	*Cervus nippon taiouanus*	Taiwan	do	E	50	NA	NA
Deer, hog	*Axis (= Cervus) porcinus annamiticus*	Thailand, Indochina	do	E	15	NA	NA
Deer, key	*Odocoileus virginianus clavium*	U.S.A. (FL)	do	E	1	NA	NA
Deer, marsh	*Blastocerus dichotomus*	Argentina, Uruguay, Paraguay, Bolivia, Brazil.	do	E	3	NA	NA
Deer, McNeill's	*Cervus elaphus macneilli*	China (Sinkiang, Tibet)	do	E	3	NA	NA
Deer, musk	*Moschus* spp. (all species)	Central and East Asia	Afghanistan, Bhutan, Burma, China (Tibet, Yunnan), India, Nepal, Pakistan, Sikkim.	E	15	NA	NA
Deer, North China sika	*Cervus nippon mandarinus*	China (Shantung and Chihli Provinces)	Entire	E	50	NA	NA
Deer, pampas	*Ozotoceros bezoarticus*	Brazil, Argentina, Uruguay, Bolivia, Paraguay.	do	E	15	NA	NA

Species: Common name	Species: Scientific name	Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Deer, Persian fallow	*Dama dama mesopotamica*	Iraq, Iran	do	E	3	NA	NA
Deer, Philippine	*Axis (=Cervus) porcinus calamianensis*	Philippines (Calamian Islands)	do	E	15	NA	NA
Deer, Ryukyu sika	*Cervus nippon keramae*	Japan (Ryukyu Islands)	do	E	50	NA	NA
Deer, Shansi sika	*Cervus nippon grassianus*	China (Shansi Province)	do	E	50	NA	NA
Deer, South China sika	*Cervus nippon kopschi*	Southern China	do	E	50	NA	NA
Deer, swamp (=barasingha)	*Cervus duvauceli*	India, Nepal	do	E	3	NA	NA
Deer, Yarkand	*Cervus elaphus yarkandensis*	China (Sinkiang)	do	E	50	NA	NA
Dhole (=Asiatic wild dog)	*Cuon alpinus*	U.S.S.R., Korea, China, India, Southeast Asia.	do	E	3	NA	NA
Dibbler	*Antechinus apicalis*	Australia	do	E	4	NA	NA
Dog, African wild	*Lycaon pictus*	Sub-Saharan Africa	do	E	139	NA	NA
Drill	*Papio leucophaeus*	Equatorial West Africa	do	E	16	NA	NA
Dugong	*Dugong dugon*	East Africa to southern Japan, including U.S.A. (Trust Territories).	do	E	4	NA	NA
Duiker, Jentink's	*Cephalophus jentinki*	Sierra Leone, Liberia, Ivory Coast	do	E	50	NA	NA
Eland, Western giant	*Taurotragus derbianus derbianus*	Senegal to Ivory Coast	do	E	50	NA	NA
Elephant, African	*Loxodonta africana*	Africa	do	T	40	NA	17.40(e)
Elephant, Asian	*Elephas maximus*	South-central and Southeast Asia	do	E	15	NA	NA
Ferret, black-footed	*Mustela nigripes*	Western U.S.A., Western Canada	do	E	1, 3	NA	NA
Fox, Northern swift	*Vulpes velox hebes*	U.S.A. (northern plains), Canada	Canada	E	3	NA	NA
Fox, San Joaquin kit	*Vulpes macrotis mutica*	U.S.A. (CA)	Entire	E	1	NA	NA
Fox, Simien	*Canis (Simenia) simensis*	Ethiopia	do	E	50	NA	NA
Gazelle, Clark's (=Dibatag)	*Ammodorcas clarkei*	Somalia, Ethiopia	do	E	3	NA	NA
Gazelle, Cuvier's	*Gazella cuvieri*	Morocco, Algeria, Tunisia	do	E	3	NA	NA
Gazelle, Mhorr	*Gazella dama mhorr*	Morocco	do	E	3	NA	NA
Gazelle, Moroccan (=Dorcas)	*Gazella dorcas massaesyla*	Morocco, Algeria, Tunisia	do	E	3	NA	NA
Gazelle, Rio de Oro Dama	*Gazella dama lozanoi*	Western Sahara	do	E	3	NA	NA
Gazelle, Arabian	*Gazella gazella*	Arabian Peninsula, Palestine, Sinai	do	E	50	NA	NA
Gazelle, sand	*Gazella subgutturosa marica*	Jordan, Arabian Peninsula	do	E	50	NA	NA
Gazelle, Saudi Arabian	*Gazella dorcas saudiya*	Israel, Iraq, Jordan, Syria, Arabian Peninsula.	do	E	50	NA	NA
Gazelle, Pelzeln's	*Gazella dorcas pelzelni*	Somalia	do	E	50	NA	NA
Gazelle, slender-horned (=Rhim)	*Gazella leptoceros*	Sudan, Egypt, Algeria, Libya	do	E	3	NA	NA
Gibbons	*Hylobates* spp. (including *Nomascus*)	China, India, Southeast Asia	do	E	3, 15	NA	NA
Goat, wild (=Chiltan markhor)	*Capra aegagrus (=falconeri chiltanensis)*.	Southwestern Asia	Chiltan Range of west-central Pakistan.	E	15	NA	NA
Goral	*Nemorhaedus goral*	East Asia	Entire	E	15	NA	NA
Gorilla	*Gorilla gorilla*	Central and Western Africa	do	E	3	NA	NA
Hare, hispid	*Caprolagus hispidus*	India, Nepal, Bhutan	do	E	15	NA	NA
Hartebeest, Swayne's	*Alcelaphus buselaphus swaynei*	Ethiopia, Somalia	do	E	3, 50	NA	NA
Hartebeest, Tora	*Alcelaphus buselaphus tora*	Ethiopia, Sudan, Egypt	do	E	50	NA	NA
Hog, pygmy	*Sus salvanius*	India, Nepal, Bhutan, Sikkim	do	E	3	NA	NA
Horse, Przewalski's	*Equus przewalskii*	Mongolia, China	do	E	15	NA	NA
Huemul, North Andean	*Hippocamelus antisensis*	Ecuador, Peru, Ch[illegible]ia, Argentina	do	E	15	NA	NA
Huemul, South Andean	*Hippocamelus bisulcus*	Chile, Argentina	do	E	15	NA	NA
Hyena, Barbary	*Hyaena hyaena barbara*	Morocco, Algeria, Tunisia	do	E	3	NA	NA
Hyena, brown	*Hyaena brunnea*	Southern Africa	do	E	3	NA	NA
Ibex, Pyrenean	*Capra pyrenaica pyrenaica*	Spain	do	E	3	NA	NA
Ibex, Walia	*Capra walie*	Ethiopia	do	E	3	NA	NA
Impala, black-faced	*Aepyceros melampus petersi*	Namibia, Angola	do	E	3	NA	NA
Indri	*Indri indri* (=entire genus)	Malagasy Republic (=Madagascar)	do	E	3	NA	NA
Jaguar	*Panthera onca*	U.S.A. (TX, NM, AZ), C. and S. America	Mexico southward	E	5	NA	NA

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Jaguarundi	*Felis yagouaroundi cacomitli*	U.S.A. (TX), Mexico	Entire	E	15	NA	NA
Jaguarundi	*Felis yagouaroundi fossata*	Mexico, Nicaragua	do	E	15	NA	NA
Jaguarundi	*Felis yagouaroundi panamensis*	Nicaragua, Costa Rica, Panama	do	E	15	NA	NA
Jaguarundi	*Felis yagouaroundi tolteca*	U.S.A. (AZ), Mexico	do	E	15	NA	NA
Kangaroo, eastern gray	*Macropus giganteus* (all subspecies except *tasmaniensis*)	Australia	do	T	7	NA	17.40(a)
Kangaroo, red	*Macropus (Megaleia) rufus*	do	do	T	7	NA	17.40(a)
Kangaroo, Tasmanian forester	*Macropus giganteus tasmaniensis*	Australia (Tasmania)	do	E	6	NA	NA
Kangaroo, western gray	*Macropus fuliginosus*	Australia	do	T	7	NA	17.40(a)
Kouprey	*Bos sauveli*	Vietnam, Laos, Cambodia, Thailand	do	E	3	NA	NA
Langur, capped	*Presbytis pileata*	India, Burma, Bangladesh	do	E	15	NA	NA
Langur, entellus	*Presbytis entellus*	China (Tibet), India, Pakistan, Kashmir, Sri Lanka, Sikkim, Bangladesh	do	E	15	NA	NA
Langur, Douc	*Pygathrix nemaeus*	Cambodia, Laos, Vietnam	do	E	3	NA	NA
Langur, Francois'	*Presbytis francoisi*	China (Kwangsi), Indochina	do	E	16	NA	NA
Langur, golden	*Presbytis geei*	India (Assam), Bhutan	do	E	15	NA	NA
Langur, long-tailed	*Presbytis potenziani*	Indonesia	do	T	16	NA	17.40(c)
Langur, Pagi Island	*Nasalis (Simias) concolor*	do	do	E	3	NA	NA
Langur, purple-faced	*Presbytis senex*	Sri Lanka (= Ceylon)	do	T	16	NA	17.40(c)
Langur, Tonkin snub-nosed	*Pygathrix (Rhinopithecus) avunculus*	Vietnam	do	T	16	NA	17.40(c)
Lechwe, red	*Kobus leche*	Southern Africa	do	T	3, 15, 106	NA	NA
Lemurs	Lemuridae (incl. Cheirogaleidae, Lepilemuridae); all members of genera *Lemur, Phaner, Hapalemur, Lepilemur, Microcebus, Allocebus, Cheirogaleus, Varecia.*	Malagasy Republic (= Madagascar)	do	E	3, 15	NA	NA
Leopard	*Panthera pardus*	Africa, Asia	Wherever found, except where it is listed as Threatened as set forth below	E	3, 5, 114	NA	NA
Do	do	do	In Africa, in the wild, south of, and including, the following countries: Gabon, Congo, Zaire, Uganda, Kenya.	T	3, 5, 114	NA	17.40(f)
Leopard, clouded	*Neofelis nebulosa*	Southeast and south-central Asia, Taiwan.	Entire	E	3, 15	NA	NA
Leopard, snow	*Panthera uncia*	Central Asia	do	E	5	NA	NA
Linsang, spotted	*Prionodon pardicolor*	Nepal, Assam, Vietnam, Cambodia, Laos, Burma.	do	E	15	NA	NA
Lion, Asiatic	*Panthera leo persica*	Turkey to India	do	E	3	NA	NA
Loris, lesser slow	*Nycticebus pygmaeus*	Indochina	do	T	16	NA	17.40(c)
Lynx, Spanish	*Felis (= Lynx) pardina*	Spain, Portugal	do	E	3	NA	NA
Macaque, Formosan rock	*Macaca cyclopis*	Taiwan	do	T	16	NA	17.40(c)
Macaque, Japanese	*Macaca fuscata*	Japan (Shikoku, Kyushu and Honshu Islands).	do	T	16	NA	17.40(c)
Macaque, lion-tailed	*Macaca silenus*	India	do	E	3	NA	NA
Macaque, stump-tailed	*Macaca arctoides*	India (Assam) to southern China	do	T	16	NA	17.40(c)

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Macaque, Toque	*Macaca sinica*	Sri Lanka (=Ceylon)	do	T	16	NA	17.40(c)
Manatee, Amazonian	*Trichechus inunguis*	South America (Amazon River Basin)	do	E	3	NA	NA
Manatee, West African	*Trichechus senegalensis*	West Coast of Africa from Senegal River to Cuanza River.	do	T	52	NA	NA
Manatee, West Indian (Florida)	*Trichechus manatus*	U.S.A. (southeastern), Caribbean Sea, South America.	do	E	1, 3	17.95(a)	NA
Mandrill	*Papio sphinx*	Equatorial West Africa	do	E	16	NA	NA
Mangabey, Tana River	*Cercocebus galeritus*	Kenya	do	E	3	NA	NA
Mangabey, white-collared	*Cercocebus torquatus*	Senegal to Ghana; Nigeria to Gabon	do	E	16	NA	NA
Margay	*Felis wiedii*	U.S.A. (TX), C. and S. America	Mexico southward	E	5	NA	NA
Markhor, Kabal	*Capra falconeri megaceros*	Afghanistan, Pakistan	Entire	E	15	NA	NA
Markhor, straight-horned	*Capra falconeri jerdoni*	do	do	E	15	NA	NA
Marmoset, buff-headed	*Callithrix flaviceps*	Brazil	do	E	139	NA	NA
Marmoset, cotton-top	*Saguinus oedipus*	Costa Rica to Colombia	do	E	16	NA	NA
Marmoset, Goeldi's	*Callimico goeldii*	Brazil, Colombia, Ecuador, Peru, Bolivia	do	E	3	NA	NA
Marmot, Vancouver Island	*Marmota vancouverensis*	Canada (Vancouver Island)	do	E	139	NA	NA
Marsupial, eastern jerboa	*Antechinomys laniger*	Australia	do	E	4	NA	NA
Marsupial-mouse, large desert	*Sminthopsis psammophila*	do	do	E	4	NA	NA
Marsupial-mouse, long-tailed	*Sminthopsis longicaudata*	do	do	E	4	NA	NA
Marten, Formosan yellow-throated	*Martes flavigula chrysospila*	Taiwan	do	E	3	NA	NA
Monkey, black colobus	*Colobus satanas*	Equatorial Guinea, People's Republic of Congo, Cameroon, Gabon.	do	E	16	NA	NA
Monkey, black howler	*Alouatta pigra*	Mexico, Guatemala, Belize	do	T	16	NA	17.40(c)
Monkey, Diana	*Cercopithecus diana*	Coastal West Africa	do	E	16	NA	NA
Monkey, howler	*Alouatta palliata* (=*villosa*)	Mexico to South America	do	E	15	NA	NA
Monkey, L'hoest's	*Cercopithecus lhoesti*	Upper Eastern Congo Basin, Cameroon	do	E	16	NA	NA
Monkey, Preuss' red colobus	*Colobus badius preussi*	Cameroon	do	E	139	NA	NA
Monkey, proboscis	*Nasalis larvatus*	Borneo	do	E	15	NA	NA
Monkey, red-backed squirrel	*Saimiri oerstedii*	Costa Rica, Panama	do	E	3	NA	NA
Monkey, red-bellied	*Cercopithecus erythrogaster*	Western Nigeria	do	E	16	NA	NA
Monkey, red-eared nose-spotted	*Cercopithecus erythrotis*	Nigeria, Cameroon, Fernando Po	do	E	16	NA	NA
Monkey, spider	*Ateles geoffroyi frontatus*	Costa Rica, Nicaragua	do	E	3	NA	NA
Monkey, spider	*Ateles geoffroyi panamensis*	Costa Rica, Panama	do	E	3	NA	NA
Monkey, Tana River red colobus	*Colobus rufomitratus* (=*badius*) *rufomitratus*.	Kenya	do	E	3, 16	NA	NA
Monkey, woolly spider	*Brachyteles arachnoides*	Brazil	do	E	3	NA	NA
Monkey, yellow-tailed woolly	*Lagothrix flavicauda*	Andes of northern Peru	do	E	16	NA	NA
Monkey, Zanzibar red colobus	*Colobus kirki*	Tanzania	do	E	3	NA	NA
Mouse, Alabama beach	*Peromyscus polionotus ammobates*	U.S.A. (AL)	do	E	183	17.95(a)	NA
Mouse, Australian native	*Zyzomys* (=*Notomys*) *pedunculatus*	Australia	do	E	15	NA	NA
Mouse, Australian native	*Notomys aquilo*	do	do	E	15	NA	NA
Mouse, Choctawhatchee beach	*Peromyscus polionotus allophrys*	U.S.A. (FL)	do	E	183	17.95(a)	NA
Mouse, Field's	*Pseudomys fieldi*	Australia	do	E	4	NA	NA
Mouse, Gould's	*Pseudomys gouldii*	do	do	E	6	NA	NA
Mouse, Key Largo cotton	*Peromyscus gossypinus allapaticola*	U.S.A. (FL)	do	E	131E, 160	NA	NA
Mouse, New Holland	*Pseudomys novaehollandiae*	Australia	do	E	4	NA	NA
Mouse, Perdido Key beach	*Peromyscus polionotus trissyllepsis*	U.S.A. (AL, FL)	do	E	183	17.95(a)	NA
Mouse, salt marsh harvest	*Reithrodontomys raviventris*	U.S.A. (CA)	do	E	2	NA	NA
Mouse, Shark Bay	*Pseudomys praeconis*	Australia	do	E	4	NA	NA
Mouse, Shortridge's	*Pseudomys shortridgei*	do	do	E	4	NA	NA
Mouse, Smoky	*Pseudomys fumeus*	do	do	E	4	NA	NA
Mouse, western	*Pseudomys occidentalis*	do	do	E	4	NA	NA

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Muntjac, Fea's	*Muntiacus feae*	Northern Thailand, Burma	do	E	50	NA	NA
Native-cat, eastern	*Dasyurus viverrinus*	Australia	do	E	6	NA	NA
Numbat	*Myrmecobius fasciatus*	do	do	E	4, 6	NA	NA
Ocelot	*Felis pardalis*	U.S.A. (AZ, TX) to C. and S. America	do	E	5, 119	NA	NA
Orangutan	*Pongo pygmaeus*	Borneo, Sumatra	do	E	3	NA	NA
Oryx, Arabian	*Oryx leucoryx*	Arabian Peninsula	do	E	3	NA	NA
Otter, Cameroon clawless	*Aonyx (Paraonyx) congica microdon*	Cameroon, Nigeria	do	E	3	NA	NA
Otter, giant	*Pteronura brasiliensis*	South America	do	E	3	NA	NA
Otter, long-tailed	*Lutra longicaudis* (incl. *platensis*)	do	do	E	3, 15	NA	NA
Otter, marine	*Lutra felina*	Peru south to Straits of Magellan	do	E	15	NA	NA
Otter, southern river	*Lutra provocax*	Chile, Argentina	do	E	15	NA	NA
Otter, southern sea	*Enhydra lutris nereis*	West coast U.S.A. (WA, OR, CA) south to Mexico (Baja California).	do	T	21	NA	NA
Panda, giant	*Ailuropoda melanoleuca*	People's Republic of China	do	E	139	NA	NA
Pangolin (=scaly anteater)	*Manis temmincki*	Africa	do	E	15	NA	NA
Panther, Florida	*Felis concolor coryi*	U.S.A. (LA and AR east to SC and FL)	do	E	1	NA	NA
Planigale, little	*Planigale ingrami subtilissima* (formerly *P. subtilissima*).	Australia	do	E	4	NA	NA
Planigale, southern	*Planigale tenuirostris*	do	do	E	4	NA	NA
Porcupine, thin-spined	*Chaetomys subspinosus*	Brazil	do	E	3	NA	NA
Possum, mountain pygmy	*Burramys parvus*	Australia	do	E	4	NA	NA
Possum, scaly-tailed	*Wyulda squamicaudata*	do	do	E	4	NA	NA
Prairie dog, Mexican	*Cynomys mexicanus*	Mexico	do	E	3	NA	17.40(g)
Prairie dog, Utah	*Cynomys parvidens*	U.S.A. (UT)	do	T	6, 149	NA	NA
Pronghorn, peninsular	*Antilocapra americana peninsularis*	Mexico (Baja California)	do	E	10	NA	NA
Pronghorn, Sonoran	*Antilocapra americana sonoriensis*	U.S.A. (AZ), Mexico	do	E	1, 3	NA	NA
Pudu	*Pudu pudu*	Southern South America	do	E	15	NA	NA
Puma, Costa Rican	*Felis concolor costaricensis*	Nicaragua, Panama, Costa Rica	do	E	15	NA	NA
Quokka	*Setonix brachyurus*	Australia	do	E	6	NA	NA
Rabbit, Ryukyu	*Pentalagus furnessi*	Japan (Ryukyu Islands)	do	E	50	NA	NA
Rabbit, volcano	*Romerolagus diazi*	Mexico	do	E	3	NA	NA
Rat, false water	*Xeromys myoides*	Australia	do	E	4	NA	NA
Rat, Fresno kangaroo	*Dipodomys nitratoides exilis*	U.S.A. (CA)	do	E	170	17.95(a)	NA
Rat, Morro Bay kangaroo	*Dipodomys heermanni morroensis*	do	do	E	2	17.95(a)	NA
Rat, stick-nest	*Leporillus conditor*	Australia	do	E	6	NA	NA
Rat-kangaroo, brush-tailed	*Bettongia penicillata*	do	do	E	4	NA	NA
Rat-kangaroo, Gaimard's	*Bettongia gaimardi*	do	do	E	6	NA	NA
Rat-kangaroo, Lesuer's	*Bettongia lesueur*	do	do	E	4	NA	NA
Rat-kangaroo, plain	*Caloprymnus campestris*	do	do	E	4	NA	NA
Rat-kangaroo, Queensland	*Bettongia tropica*	do	do	E	4	NA	NA
Rhinoceros, black	*Diceros bicornis*	Sub-Saharan Africa	do	E	97	NA	NA
Rhinoceros, great Indian	*Rhinoceros unicornis*	India, Nepal	do	E	4	NA	NA
Rhinoceros, Javan	*Rhinoceros sondaicus*	Indonesia, Indochina, Burma, Thailand, Sikkim, Bangladesh, Malaysia.	do	E	3	NA	NA
Rhinoceros, northern white	*Ceratotherium simum cottoni*	Zaire, Sudan, Uganda, Central African Republic.	do	E	3	NA	NA
Rhinoceros, Sumatran	*Dicerorhinus (=Didermoceros) sumatrensis*.	Bangladesh to Vietnam to Indonesia (Borneo).	do	E	3	NA	NA
Saiga, Mongolian (antelope)	*Saiga tatarica mongolica*	Mongolia	do	E	15	NA	NA
Saki, white-nosed	*Chiropotes albinasus*	Brazil	do	E	3	NA	NA
Seal, Caribbean monk	*Monachus tropicalis*	Caribbean Sea, Gulf of Mexico	do	E	1, 2, 45	NA	NA
Seal, Guadalupe fur	*Arctocephalus townsendi*	U.S.A. (Farallon Islands, CA) south to Mexico (Islas Revillagigedo)	do	T	212	NA	227.11

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Seal, Hawaiian monk	*Monachus schauinslandi*	Hawaiian Archipelago	do	E	18	NA	NA
Seal, Mediterranean monk	*Monachus monachus*	Mediterranean, Northwest African Coast and Black Sea.	do	E	3	NA	NA
Seladang (=Gaur)	*Bos gaurus*	Bangladesh, Southeast Asia, India	do	E	3	NA	NA
Serow, Sumatran	*Capricornis sumatraensis*	Sumatra	do	E	15	NA	NA
Serval, Barbary	*Felis serval constantina*	Algeria	do	E	3	NA	NA
Shapo	*Ovis vignei vignei*	Kashmir	do	E	15	NA	NA
Shou	*Cervus elaphus wallichi*	Tibet, Bhutan	do	E	3	NA	NA
Siamang	*Symphalangus syndactylus*	Malaysia, Indonesia	do	E	15	NA	NA
Sifakas	*Propithecus* spp. (all species)	Malagasy Republic (=Madagascar)	do	E	4	NA	NA
Sloth, Brazilian three-toed	*Bradypus torquatus*	Brazil	do	E	3, 4	NA	NA
Solenodon, Cuban	*Solendon (Atopogale) cubanus*	Cuba	do	E	3	NA	NA
Solenodon, Haitian	*Solenodon paradoxus*	Dominican Republic, Haiti	do	E	3	NA	NA
Squirrel, Carolina northern flying	*Glaucomys sabrinus coloratus*	U.S.A. (NC, TN)	do	E	189	NA	NA
Squirrel, Delmarva Peninsula fox	*Sciurus niger cinereus*	U.S.A. (Delmarva Peninsula to southeast PA).	Entire, except Sussex Co., DE	E	1, 161, 168	NA	NA
Do	do	do	U.S.A. (DE—Sussex County)	XN	161	NA	17.84(a)
Squirrel, Virginia northern flying	*Glaucomys sabrinus fuscus*	U.S.A. (VA, WV)	Entire	E	189	NA	NA
Stag, Barbary	*Cervus elaphus barbarus*	Tunisia, Algeria	do	E	3	NA	NA
Stag, Kashmir	*Cervus elaphus hanglu*	Kashmir	do	E	3	NA	NA
Suni, Zanzibar	*Neotragus (Nesotragus) moschatus moschatus.*	Zanzibar (and nearby islands)	do	E	50	NA	NA
Tahr, Arabian	*Hemitragus jayakari*	Oman	do	E	50	NA	NA
Tamaraw	*Bubalus mindorensis*	Philippines	do	E	4	NA	NA
Tamarin, golden-rumped (=golden-headed Tamarin; =golden-lion Marmoset).	*Leontopithecus (=Leontideus)* spp. (all species).	Brazil	do	E	3	NA	NA
Tamarin, pied	*Saguinus bicolor*	Northern Brazil	do	E	16	NA	NA
Tamarin, white-footed	*Saguinus leucopus*	Northern Colombia	do	T	16	NA	17.40(c)
Tapir, Asian	*Tapirus indicus*	Burma, Laos, Cambodia, Vietnam, Malaysia, Indonesia, Thailand.	do	E	15	NA	NA
Tapir, Brazilian	*Tapirus terrestris*	Colombia and Venezuela south to Paraguay and Argentina.	do	E	3	NA	NA
Tapir, Central American	*Tapirus bairdii*	Southern Mexico to Colombia and Ecuador.	do	E	3	NA	NA
Tapir, mountain	*Tapirus pinchaque*	Colombia, Ecuador and possibly Peru and Venezuela.	do	E	3	NA	NA
Tarsier, Philippine	*Tarsius syrichta*	Philippines	do	T	16	NA	17.40(c)
Tiger	*Panthera tigris*	Temperate and Tropical Asia	do	E	3, 5	NA	NA
Tiger, Tasmanian (=Thylacine)	*Thylacinus cynocephalus*	Australia	do	E	3	NA	NA
Uakari (all species)	*Cacajao* spp. (all species)	Peru, Brazil, Ecuador, Colombia, Venezuela.	do	E	3	NA	NA
Urial	*Ovis musimon (=orientalis) ophion*	Cyprus	do	E	15	NA	NA
Vicuna	*Vicugna vicugna*	South America (Andes)	do	E	3	NA	NA
Vole, Amargosa	*Microtus californicus scirpensis*	U.S.A. (CA)	do	E	166	17.95(a)	NA
Wallaby, banded hare	*Lagostrophus fasciatus*	Australia	do	E	4	NA	NA
Wallaby, brindled nail-tailed	*Onychogalea fraenata*	do	do	E	4	NA	NA
Wallaby, crescent nail-tailed	*Onychogalea lunata*	do	do	E	4	NA	NA
Wallaby, Parma	*Macropus parma*	do	do	E	4	NA	NA
Wallaby, Western hare	*Lagorchestes hirsutus*	do	do	E	4	NA	NA
Wallaby, yellow-footed rock	*Petrogale xanthopus*	do	do	E	6	NA	NA
Whale, blue	*Balaenoptera musculus*	Oceanic	do	E	3	NA	NA

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Whale, bowhead	*Balaena mysticetus*	Oceanic (north latitudes only)	do	E	3	NA	NA
Whale, finback	*Balaenoptera physalus*	Oceanic	do	E	3	NA	NA
Whale, gray	*Eschrichtius robustus*	North Pacific Ocean: coastal and Bering Sea.	do	E	3	NA	NA
Whale, humpback	*Megaptera novaeangliae*	Oceanic	do	E	3	NA	NA
Whale, right	*Balaena glacialis*	do	do	E	3	NA	NA
Whale, Sei	*Balaenoptera borealis*	do	do	E	3	NA	NA
Whale, sperm	*Physeter catodon*	do	do	E	3	NA	NA
Wolf, gray	*Canis lupus*	Holarctic	U.S.A. (48 conterminous States, except MN), Mexico.	E	1, 6, 13, 15, 35	17.95(a)	NA
Do	do	do	U.S.A. (MN)	T	35	17.95(a)	17.40(d)
Wolf, maned	*Chrysocyon brachyurus*	Argentina, Bolivia, Brazil, Paraguay, Uruguay.	Entire	E	4	NA	NA
Wolf, red	*Canis rufus*	U.S.A. (southeastern U.S.A. west to central TX).	do	E	1	NA	NA
Wombat, hairy-nosed (=Barnard's and Queensland hairy-nosed).	*Lasiorhinus krefftii* (formerly *L. barnardi* and *L. gillespiei*).	Australia	do	E	4, 6	NA	NA
Woodrat, Key Largo	*Neotoma floridana smalli*	U.S.A. (FL)	do	E	131E, 160	NA	NA
Yak, wild	*Bos grunniens*	China (Tibet), India	do	E	3	NA	NA
Zebra, Grevy's	*Equus grevyi*	Kenya, Ethiopia, Somalia	do	T	54	NA	NA
Zebra, Hartmann's mountain	*Equus zebra hartmannae*	Namibia, Angola	do	T	54, 111	NA	NA
Zebra, mountain	*Equus zebra zebra*	South Africa	do	E	15, 111	NA	NA
BIRDS							
Akepa, Hawaii (honeycreeper)	*Loxops coccineus coccineus*	U.S.A. (HI)	do	E	2	NA	NA
Akepa, Maui (honeycreeper)	*Loxops coccineus ochraceus*	do	do	E	2	NA	NA
Akialoa, Kauai (honeycreeper)	*Hemignathus procerus*	do	do	E	1	NA	NA
Akiapolaau (honeycreeper)	*Hemignathus munroi* (=*wilsoni*)	do	do	E	1	NA	NA
Albatross, short-tailed	*Diomedea albatrus*	North Pacific Ocean: Japan, U.S.S.R., U.S.A. (AK, CA, HI, OR, WA).	Entire, except U.S.A.	E	3	NA	NA
Blackbird, yellow-shouldered	*Agelaius xanthomus*	U.S.A. (PR)	Entire	E	17	17.95(b)	NA
Bobwhite, masked (quail)	*Colinus virginianus ridgwayi*	U.S.A. (AZ), Mexico (Sonora)	do	E	1, 3	NA	NA
Booby, Abbott's	*Sula abbotti*	Indian Ocean: Christmas Island	do	E	15	NA	NA
Bristlebird, western	*Dasyornis brachypterus longirostris*	Australia	do	E	3	NA	NA
Bristlebird, western rufous	*Dasyornis broadbenti littoralis*	do	do	E	15	NA	NA
Broadbill, Guam	*Myiagra freycineti*	Western Pacific Ocean: U.S.A. (Guam)	do	E	156	NA	NA
Bulbul, Mauritius olivaceous	*Hypsipetes borbonicus olivaceus*	Indian Ocean: Mauritius	do	E	3	NA	NA
Bullfinch, Sao Miguel (finch)	*Pyrrhula pyrrhula murina*	Eastern Atlantic Ocean: Azores	do	E	3	NA	NA
Bushwren, New Zealand	*Xenicus longipes*	New Zealand	do	E	3	NA	NA
Bustard, great Indian	*Choriotis nigriceps*	India, Pakistan	do	E	3	NA	NA
Cahow (=Bermuda Petrel)	*Pterodroma cahow*	North Atlantic Ocean: Bermuda	do	E	3	NA	NA
Condor, Andean	*Vultur gryphus*	Colombia to Chile and Argentina	do	E	4	NA	NA
Condor, California	*Gymnogyps californianus*	U.S.A. (OR, CA), Mexico (Baja California).	do	E	1	17.95(b)	NA
Coot, Hawaiian (=alae keo keo)	*Fulica americana alai*	U.S.A. (HI)	do	E	2	NA	NA
Cotinga, banded	*Cotinga maculata*	Brazil	do	E	15	NA	NA
Cotinga, white-winged	*Xipholena atropurpurea*	do	do	E	15	NA	NA
Crane, black-necked	*Grus nigricollis*	China (Tibet)	do	E	15	NA	NA
Crane, Cuba sandhill	*Grus canadensis nesiotes*	West Indies: Cuba	do	E	15	NA	NA
Crane, hooded	*Grus monacha*	Japan, U.S.S.R.	do	E	4	NA	NA

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Crane, Japanese	*Grus japonensis*	China, Japan, Korea, U.S.S.R.	do	E	3	NA	NA
Crane, Mississippi sandhill	*Grus canadensis pulla*	U.S.A. (MS)	do	E	6	17.95(b)	NA
Crane, Siberian white	*Grus leucogeranus*	U.S.S.R. (Siberia) to India, including Iran and China.	do	E	4	NA	NA
Crane, white-naped	*Grus vipio*	Mongolia	do	E	15	NA	NA
Crane, whooping	*Grus americana*	Canada, U.S.A. (Rocky Mountains east to Carolinas), Mexico.	do	E	1, 3	17.95(b)	NA
Creeper, Hawaii	*Oreomystis* (= *Loxops*) *mana*	U.S.A. (HI)	do	E	10	NA	NA
Creeper, Molokai (= kakawahie)	*Paroreomyza* (= *Oreomystis*, = *Loxops*) *flammea*.	do	do	E	2	NA	NA
Creeper, Oahu (= alauwahio)	*Paroreomyza* (= *Oreomystis*, = *Loxops*) *maculata*.	do	do	E	2	NA	NA
Crow, Hawaiian (= 'alala)	*Corvus hawaiiensis* (= *tropicus*)	do	do	E	1	NA	NA
Crow, Mariana	*Corvus kubaryi*	Western Pacific Ocean: U.S.A. (Guam, Rota).	do	E	156	NA	NA
Cuckoo-shrike, Mauritius	*Coquus* (= *Coracina*) *typicus*	Indian Ocean: Mauritius	do	E	3	NA	NA
Cuckoo-shrike, Reunion	*Coquus* (= *Coracina*) *newtoni*	Indian Ocean: Reu[illegible]	do	E	3	NA	NA
Curassow, razor-billed	*Mitu* (= *Crax*) *mitu mitu*	Brazil (Eastern)	do	E	15	NA	NA
Curassow, red-billed	*Crax blumenbachii*	Brazil	do	E	4	NA	NA
Curassow, Trinidad white-headed	*Pipile pipile pipile*	West Indies: Trinidad	do	E	3	NA	NA
Curlew, Eskimo	*Numenius borealis*	Alaska and northern Canada to Argentina.	do	E	1, 3	NA	NA
Dove, cloven-feathered	*[illegible] holosericea*	Southwest [illegible] Ocean: New Caledonia.	do	E	3	NA	NA
Dove, Grenada gray-fronted	*Leptotila rufaxilla wellsi*	West Indies: Grenada	do	E	3	NA	NA
Duck, Hawaiian (= koloa)	*Anas wyvilliana*	U.S.A. (HI)	do	E	1	NA	NA
Duck, Laysan	*Anas laysanensis*	do	do	E	1	NA	NA
Duck, pink-headed	*Rhodonessa caryophyllacea*	India	do	E	15	NA	NA
Duck, white-winged wood	*Cairina scutulata*	India, Malaysia, Indonesia, Thailand	do	E	3	NA	NA
Eagle, Greenland white-tailed	*Haliaeetus albicilla groenlandicus*	Greenland and adjacent Atlantic islands	do	E	15	NA	NA
Eagle, harpy	*Harpia harpyja*	Mexico south to Argentina	do	E	15	NA	NA
Eagle, Philippine (= monkey-eating)	*Pithecophaga jefferyi*	Philippines	do	E	3	NA	NA
Eagle, bald	*Haliaeetus leucocephalus*	North America south to northern Mexico	U.S.A. (conterminous States, except WA, OR, MN, WI, MI).	E	1, 34	NA	NA
Do	do	do	U.S.A. (WA, OR, MN, WI, MI).	T	34	NA	17.41(a)
Eagle, Spanish imperial	*Aquila heliaca adalberti*	Spain, Morocco, Algeria	Entire	E	3	NA	NA
Egret, Chinese	*Egretta eulophotes*	China, Korea	do	E	3	NA	NA
Falcon, American peregrine	*Falco peregrinus anatum*	Nests from central Alaska across north-central Canada to central Mexico, winters south to South America.	do	E	2, 3, 145	17.95(b)	NA
Falcon, Arctic peregrine	*Falco peregrinus tundrius*	Nests from northern Alaska to Greenland; winters south to Central and South America.	do	T	2, 3, 145	NA	NA
Falcon, Eurasian peregrine	*Falco peregrinus peregrinus*	Europe, Eurasia south to Africa and Mideast.	do	E	15	NA	NA
Falcon, peregrine	*Falco peregrinus*	Worldwide, except Antarctica and most Pacific Islands.	Wherever found in wild in the conterminous 48 States.	E(S/A)	145	NA	NA

Species — Common name	Species — Scientific name	Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Finch, Laysan (honeycreeper)	*Telespyza* (=*Psittirostra*) *cantans*	U.S.A. (HI)	Entire	E	1	NA	NA
Finch, Nihoa (honeycreeper)	*Telespyza* (=*Psittirostra*) *ultima*	do	do	E	1	NA	NA
Flycatcher, Euler's	*Empidonax euleri johnstonei*	West Indies: Grenada	do	E	3	NA	NA
Flycatcher, Seychelles paradise	*Terpsiphone corvina*	Indian Ocean: Seychelles	do	E	3	NA	NA
Flycatcher, Tahiti	*Pomarea nigra*	South Pacific Ocean: Tahiti	do	E	3	NA	NA
Fody, Seychelles (weaver-finch)	*Foudia sechellarum*	Indian Ocean: Seychelles	do	E	3	NA	NA
Frigatebird, Andrew's	*Fregata andrewsi*	East Indian Ocean	do	E	15	NA	NA
Goose, Aleutian Canada	*Branta canadensis leucopareia*	U.S.A. (AK, CA, OR, WA), Japan	do	E	1, 3	NA	NA
Goose, Hawaiian (=nene)	*Nesochen* (=*Branta*) *sandvicensis*	U.S.A. (HI)	do	E	1	NA	NA
Goshawk, Christmas Island	*Accipiter fasciatus natalis*	Indian Ocean: Christmas Island	do	E	3	NA	NA
Grackle, slender-billed	*Quiscalus* (=*Cassidix*) *palustris*	Mexico	do	E	3	NA	NA
Grasswren, Eyrean (flycatcher)	*Amytornis goyderi*	Australia	do	E	3	NA	NA
Grebe, Atitlan	*Podilymbus gigas*	Guatemala	do	E	3	NA	NA
Greenshank, Nordmann's	*Tringa guttifer*	U.S.S.R., Japan, south to Malaya, Borneo	do	E	15	NA	NA
Guan, horned	*Oreophasis derbianus*	Guatemala, Mexico	do	E	3	NA	NA
Gull, Audouin's	*Larus audouinii*	Mediterranean Sea	do	E	3	NA	NA
Gull, relict	*Larus relictus*	India, China	do	E	15	NA	NA
Hawk, Anjouan Island sparrow	*Accipiter francesii pusillus*	Indian Ocean: Comoro Islands	do	E	3	NA	NA
Hawk, Galapagos	*Buteo galapagoensis*	Ecuador (Galapagos Islands)	do	E	3	NA	NA
Hawk, Hawaiian (=Io)	*Buteo solitarius*	U.S.A. (HI)	do	E	1	NA	NA
Hermit, hook-billed (hummingbird)	*Glaucis* (=*Ramphodon*) *dohrnii*	Brazil	do	E	15	NA	NA
Honeycreeper, crested (='akohekohe)	*Palmeria dolei*	U.S.A. (HI)	do	E	1	NA	NA
Hornbill, helmeted	*Rhinoplax vigil*	Thailand, Malaysia	do	E	15	NA	NA
Honeyeater, helmeted	*Meliphaga cassidix*	Australia	do	E	4	NA	NA
Ibis, Japanese crested	*Nipponia nippon*	China, Japan, U.S.S.R., Korea	do	E	3	NA	NA
Kagu	*Rhynochetos jubatus*	South Pacific Ocean: New Caledonia	do	E	3	NA	NA
Kakapo (=owl-parrot)	*Strigops habroptilus*	New Zealand	do	E	3	NA	NA
Kestrel, Mauritius	*Falco punctatus*	Indian Ocean: Mauritius	do	E	3	NA	NA
Kestrel, Seychelles	*Falco araea*	Indian Ocean: Seychelles Islands	do	E	3	NA	NA
Kingfisher, Guam Micronesian	*Halcyon cinnamomina cinnamomina*	Western Pacific Ocean: U.S.A. (Guam)	do	E	156	NA	NA
Kite, Cuba hook-billed	*Chondrohierax uncinatus wilsonii*	West Indies: Cuba	do	E	3	NA	NA
Kite, Grenada hook-billed	*Chondrohierax uncinatus mirus*	West Indies: Grenada	do	E	3	NA	NA
Kite, Everglade snail	*Rostrhamus sociabilis plumbeus*	U.S.A. (FL)	do	E	1	17.95(b)	NA
Kokako (wattlebird)	*Callaeas cinerea*	New Zealand	do	E	3	NA	NA
Macaw, glaucous	*Anodorhynchus glaucus*	Paraguay, Uruguay, Brazil	do	E	15	NA	NA
Macaw, indigo	*Anodorhynchus leari*	Brazil	do	E	15	NA	NA
Macaw, little blue	*Cyanopsitta spixii*	do	do	E	15	NA	NA
Magpie-robin, Seychelles (thrush)	*Copsychus sechellarum*	Indian Ocean: Seychelles Islands	do	E	3	NA	NA
Malkoha, red-faced (cuckoo)	*Phaenicophaeus pyrrhocephalus*	Sri Lanka (=Ceylon)	do	E	3	NA	NA
Mallard, Mariana	*Anas oustaleti*	West Pacific Ocean: U.S.A. (Guam, Mariana Islands)	do	E	23	NA	NA
Megapode, Micronesian (=La Perouse's)	*Megapodius laperouse*	West Pacific Ocean: U.S.A. (Palau Island, Mariana Islands)	do	E	3	NA	NA
Megapode, Maleo	*Macrocephalon maleo*	Indonesia (Celebes)	do	E	3	NA	NA
Millerbird, Nihoa (old world warbler)	*Acrocephalus familiaris kingi*	U.S.A. (HI)	do	E	1	NA	NA
Monarch, Tinian (old world flycatcher)	*Monarcha takatsukasae*	Western Pacific Ocean: U.S.A. (Mariana Islands)	do	E	3	NA	NA
Moorhen (=gallinule), Hawaiian common	*Gallinula chloropus sandvicensis*	U.S.A. (HI)	do	E	1	NA	NA
Moorhen (=gallinule), Mariana common	*Gallinula chloropus guami*	Western Pacific Ocean: U.S.A. (Guam, Tinian, Saipan, Pagan)	do	E	156	NA	NA
Nightjar (=whip-poor-will), Puerto Rico	*Caprimulgus noctitherus*	U.S.A. (PR)	do	E	6	NA	NA

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Nukupu'u (honeycreeper)	*Hemignathus lucidus*	U.S.A. (HI)	do	E	1, 2	NA	NA
'O'o, Kauai (='O'o 'A'a) (honeyeater)	*Moho braccatus*	do	do	E	1	NA	NA
Ostrich, Arabian	*Struthio camelus syriacus*	Jordan, Saudi Arabia	do	E	3	NA	NA
Ostrich, West African	*Struthio camelus spatzi*	Spanish Sahara	do	E	3	NA	NA
'O'u (honeycreeper)	*Psittirostra psittacea*	U.S.A. (HI)	do	E	1	NA	NA
Owl, Anjouan scops	*Otus rutilus capnodes*	Indian Ocean: Comoro Island	do	E	3	NA	NA
Owl, giant scops	*Otus gurneyi*	Philippines: Marinduque and Mindanao Island.	do	E	15	NA	NA
Owl, Seychelles	*Otus insularis*	Indian Ocean: Seychelles Islands	do	E	3	NA	NA
Owlet, Morden's (=Sokoke)	*Otus ireneae*	Kenya	do	E	3	NA	NA
Palila (honeycreeper)	*Loxioides (=Psittirostra) bailleui*	U.S.A. (HI)	do	E	1	17.95(b)	NA
Parakeet, Forbes'	*Cyanoramphus auriceps forbesi*	New Zealand	do	E	3, 15	NA	NA
Parakeet, golden	*Aratinga guarouba*	Brazil	do	E	4	NA	NA
Parakeet, golden-shouldered (=hooded).	*Psephotus chrysopterygius*	Australia	do	E	3	NA	NA
Parakeet, Mauritius	*Psittacula echo*	Indian Ocean: Mauritius	do	E	3	NA	NA
Parakeet, ochre-marked	*Pyrrhura cruentata*	Brazil	do	E	3	NA	NA
Parakeet, orange-bellied	*Neophema chrysogaster*	Australia	do	E	4	NA	NA
Parakeet, paradise (=beautiful)	*Psephotus pulcherrimus*	do	do	E	4	NA	NA
Parakeet, scarlet-chested (=splendid)	*Neophema splendida*	do	do	E	4	NA	NA
Parakeet, turquoise	*Neophema pulchella*	do	do	E	3	NA	NA
Parrot, Australian	*Geopsittacus occidentalis*	do	do	E	3	NA	NA
Parrot, Bahaman or Cuban	*Amazona leucocephala*	West Indies: Cuba, Bahamas, Caymans	do	E	3, 15	NA	NA
Parrot, ground	*Pezoporus wallicus*	Australia	do	E	6	NA	NA
Parrot, imperial	*Amazona imperialis*	West Indies: Dominica	do	E	3	NA	NA
Parrot, Puerto Rican	*Amazona vittata*	U.S.A. (PR)	do	E	1	NA	NA
Parrot, red-browed	*Amazona rhodocorytha*	Brazil	do	E	3	NA	NA
Parrot, red-capped	*Pionopsitta pileata*	do	do	E	15	NA	NA
Parrot, red-necked	*Amazona arausiaca*	West Indies: Dominica	do	E	50	NA	NA
Parrot, red-spectacled	*Amazona pretrei pretrei*	Brazil, Argentina	do	E	15	NA	NA
Parrot, St. Lucia	*Amazona versicolor*	West Indies: St. Lucia	do	E	3	NA	NA
Parrot, St. Vincent	*Amazona guildingii*	West Indies: St. Vincent	do	E	3	NA	NA
Parrot, thick-billed	*Rhynchopsitta pachyrhyncha*	Mexico, U.S.A. (AZ, NM)	Mexico	E	3	NA	NA
Parrot, vinaceous-breasted	*Amazona vinacea*	Brazil	Entire	E	15	NA	NA
Parrotbill, Maui (honeycreeper)	*Pseudonestor xanthophrys*	U.S.A. (HI)	do	E	1	NA	NA
Pelican, brown	*Pelecanus occidentalis*	U.S.A. (Carolinas to TX, CA), West Indies, C. and S. America: Coastal.	Entire, except U.S. Atlantic coast, FL, AL	E	2, 3, 171	NA	NA
Penguin, Galapagos	*Spheniscus mendiculus*	Ecuador (Galapagos Islands)	Entire	E	3	NA	NA
Petrel, Hawaiian dark-rumped	*Pterodroma phaeopygia sandwichensis*	U.S.A. (HI)	do	E	2, 4, 1	NA	NA
Pheasant, bar-tailed	*Syrmaticus humiae*	Burma, China	do	E	3	NA	NA
Pheasant, Blyth's tragopan	*Tragopan blythii*	Burma, China, India	do	E	3	NA	NA
Pheasant, brown eared	*Crossoptilon mantchuricum*	China	do	E	3	NA	NA
Pheasant, Cabot's tragopan	*Tragopan caboti*	do	do	E	3	NA	NA
Pheasant, Chinese monal	*Lophophorus lhuysii*	do	do	E	3	NA	NA
Pheasant, Edward's	*Lophura edwardsi*	Vietnam	do	E	3	NA	NA
Pheasant, Elliot's	*Syrmaticus ellioti*	China	do	E	15	NA	NA
Pheasant, imperial	*Lophura imperialis*	Vietnam	do	E	3	NA	NA
Pheasant, Mikado	*Syrmaticus mikado*	Taiwan	do	E	3	NA	NA
Pheasant, Palawan peacock	*Polyplectron emphanum*	Philippines	do	E	3	NA	NA
Pheasant, Sclater's monal	*Lophophorus sclateri*	Burma, China, India	do	E	3	NA	NA
Pheasant, Swinhoe's	*Lophura swinhoii*	Taiwan	do	E	3	NA	NA
Pheasant, western tragopan	*Tragopan melanocephalus*	India, Pakistan	do	E	3	NA	NA

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Pheasant, white eared	*Crossoptilon crossoptilon*	China (Tibet), India	do	E	4	NA	NA
Pigeon, Azores wood	*Columba palumbus azorica*	East Atlantic Ocean: Azores	do	E	3	NA	NA
Pigeon, Chatham island	*Hemiphaga novaeseelandiae chathamensis*	New Zealand	do	E	3	NA	NA
Pigeon, Mindoro zone-tailed	*Ducula mindorensis*	Philippines	do	E	15	NA	NA
Pigeon, Puerto Rican plain	*Columba inornata wetmorei*	U.S.A. (PR)	do	E	2	NA	NA
Piping-guan, black-fronted	*Pipile jacutinga*	Argentina	do	E	15	NA	NA
Pitta, Koch's	*Pitta kochi*	Philippines	do	E	15	NA	NA
Plover, New Zealand shore	*Thinornis novaeseelandiae*	New Zealand	do	E	3	NA	NA
Plover, piping	*Charadrius melodus*	U.S.A. (Great Lakes, northern Great Plains, Atlantic and Gulf Coasts, PR, VI), Canada, Mexico, Bahamas, West Indies.	Great Lakes watershed in States of IL, IN, MI, MN, NY, OH, PA, and WI and Province of Ontario.	E	211	NA	NA
Do	do	do	Entire, except those areas where listed as endangered above.	T	211	NA	NA
Po'ouli (honeycreeper)	*Melamprosops phaeosoma*	U.S.A. (HI)	do	E	10	NA	NA
Prairie-chicken, Attwater's greater	*Tympanuchus cupido attwateri*	U.S.A. (TX)	do	E	1	NA	NA
Quail, Merriam's Montezuma	*Cyrtonyx montezumae merriami*	Mexico (Vera Cruz)	do	E	15	NA	NA
Quetzal, resplendent	*Pharomachrus mocinno*	Mexico to Panama	do	E	15	NA	NA
Rail, Auckland Island	*Rallus pectoralis muelleri*	New Zealand	do	E	3	NA	NA
Rail, California clapper	*Rallus longirostris obsoletus*	U.S.A. (CA)	do	E	2	NA	NA
Rail, Guam	*Rallus owstoni*	Western Pacific Ocean: U.S.A. (Guam)	do	E	146E, 156	NA	NA
Rail, light-footed clapper	*Rallus longirostris levipes*	U.S.A. (CA), Mexico (Baja California)	do	E	2	NA	NA
Rail, Lord Howe wood	*Tricholimnas sylvestris*	Australia (Lord Howe Island)	do	E	15	NA	NA
Rail, Yuma clapper	*Rallus longirostris yumanensis*	Mexico, U.S.A. (AZ, CA)	do	E	1	NA	NA
Rhea, Darwin's	*Pterocnemia pennata*	Argentina, Bolivia, Peru, Uruguay	do	E	3	NA	NA
Robin, Chatham Island	*Petroica traversi*	New Zealand	do	E	3	NA	NA
Robin, scarlet-breasted (flycatcher)	*Petroica multicolor multicolor*	Australia (Norfolk Island)	do	E	3	NA	NA
Rockfowl, grey-necked	*Picathartes oreas*	Cameroon, Gabon	do	E	3	NA	NA
Rockfowl, white-necked	*Picathartes gymnocephalus*	Africa: Togo to Sierra Leone	do	E	3	NA	NA
Roller, long-tailed ground	*Uratelornis chimaera*	Malagasy Republic (=Madagascar)	do	E	3	NA	NA
Scrub-bird, noisy	*Atrichornis clamosus*	Australia	do	E	3	NA	NA
Shama, Cebu black (thrush)	*Copsychus niger cebuensis*	Philippines	do	E	3	NA	NA
Shearwater, Newell's Townsend's (formerly Manx) (='A'o)	*Puffinus auricularis* (formerly *puffinus*) *newelli*	U.S.A. (HI)	do	T	10	NA	NA
Shrike, San Clemente loggerhead	*Lanius ludovicianus mearnsi*	U.S.A. (CA)	do	E	26	NA	NA
Siskin, red	*Carduelis* (=*Spinus*) *cucullata*	South America	do	E	15	NA	NA
Sparrow, Cape Sable seaside	*Ammodramus* (=*Ammospiza*) *maritimus mirabilis*	U.S.A. (FL)	do	E	1	17.95(b)	NA
Sparrow, dusky seaside	*Ammodramus* (=*Ammospiza*) *maritimus nigrescens*	do	do	E	1	17.95(b)	NA
Sparrow, San Clemente sage	*Amphispiza belli clementeae*	U.S.A. (CA)	do	T	26	NA	NA
Starling, Ponape mountain	*Aplonis pelzelni*	West Pacific Ocean: U.S.A. (Caroline Islands)	do	E	3	NA	NA
Starling, Rothschild's (myna)	*Leucopsar rothschildi*	Indonesia (Bali)	do	E	3	NA	NA
Stilt, Hawaiian (=Ae'o)	*Himantopus himantopus knudseni*	U.S.A. (HI)	do	E	2	NA	NA

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Stork, oriental white	*Ciconia ciconia boyciana*	China, Japan, Korea, U.S.S.R.	do	E	3	NA	NA
Stork, wood	*Mycteria americana*	U.S.A. (CA, AZ, TX, to Carolinas), Mexico, Central and South America.	U.S.A. (AL, FL, GA, SC).	E	142	NA	NA
Swiftlet, Vanikoro	*Aerodramus (=Collocalia) vanikorensis bartschi.*	Western Pacific Ocean: U.S.A. (Guam, Rota, Tinian, Saipan, Agiguan).	Entire	E	156	NA	NA
Teal, Campbell Island flightless	*Anas aucklandica nesiotis*	New Zealand (Campbell Island)	do	E	15	NA	NA
Tern, California least	*Sterna antillarum (=albifrons) browni*	Mexico, U.S.A. (CA)	do	E	2, 3	NA	NA
Tern, least	*Sterna antillarum*	U.S.A. (Atlantic and Gulf coasts, Miss. R. Basin, CA), Gr. and Lesser Antilles, Bahamas, Mexico; winters C. America, northern S. America.	U.S.A. (AR, CO, IA, IL, IN, KS, KY, LA (Miss. R. and tribs. N of Baton Rouge), MS (Miss. R.), MO, MT, NE, NM, ND, OK, SD, TN, TX (Except within 50 miles of coast)).	E	182	NA	NA
Thrasher, white-breasted	*Ramphocinclus brachyurus*	West Indies: St. Lucia, Martinique	Entire	E	3	NA	NA
Thrush, large Kauai	*Myadestes (=Phaeornis) myadestinus*	U.S.A. (HI)	do	E	2	NA	NA
Thrush, Molokai (=oloma'o)	*Myadestes (=Phaeornis) lanaiensis (=obscurus) rutha.*	do	do	E	2	NA	NA
Thrush, New Zealand (wattlebird)	*Turnagra capensis*	New Zealand	do	E	3	NA	NA
Thrush, small Kauai (=puaiohi)	*Myadestes (=Phaeornis) palmeri*	U.S.A. (HI)	do	E	1	NA	NA
Tinamou, solitary	*Tinamus solitarius*	Brazil, Paraguay, Argentina	do	E	15	NA	NA
Trembler, Martinique (thrasher)	*Cinclocerthia ruficauda gutturalis*	West Indies: Martinique	do	E	3	NA	NA
Wanderer, plain (collared-hemipode)	*Pedionomous torquatus*	Australia	do	E	6	NA	NA
Warbler (wood), Bachman's	*Vermivora bachmanii*	U.S.A. (Southeastern), Cuba	do	E	1, 3	NA	NA
Warbler (wood), Barbados yellow	*Dendroica petechia petechia*	West Indies: Barbados	do	E	3	NA	NA
Warbler (wood), Kirtland's	*Dendroica kirtlandii*	U.S.A. (principally MI), Canada, West Indies: Bahama Islands.	do	E	1, 3	NA	NA
Warbler (willow), nightingale reed	*Acrocephalus luscinia*	Western Pacific Ocean	U.S.A. (Mariana Islands).	E	3, 4	NA	NA
Warbler (willow), Rodrigues	*Bebrornis rodericanus*	Mauritius (Rodrigues Islands)	Entire	E	3	NA	NA
Warbler (wood), Semper's	*Leucopeza semperi*	West Indies: St. Lucia	do	E	3	NA	NA
Warbler (willow), Seychelles	*Bebrornis sechellensis*	Indian Ocean: Seychelles Island	do	E	3	NA	NA
Whipbird, Western	*Psophodes nigrogularis*	Australia	do	E	3	NA	NA
White-eye, bridled	*Zosterops conspicillata conspicillata*	Western Pacific Ocean: U.S.A. (Guam)	do	E	156	NA	NA
White-eye, Norfolk Island	*Zosterops albogularis*	Indian Ocean: Norfolk Islands	do	E	15	NA	NA
White-eye, Ponape greater	*Rukia longirostra (=sanfordi)*	West Pacific Ocean: U.S.A. (Caroline Islands).	do	E	3	NA	NA
White-eye, Seychelles	*Zosterops modesta*	Indian Ocean: Seychelles	do	E	3	NA	NA
Woodpecker, imperial	*Campephilus imperialis*	Mexico	do	E	3	NA	NA
Woodpecker, ivory-billed	*Campephilus principalis*	U.S.A. (southcentral and southeastern), Cuba.	do	E	1, 3	NA	NA
Woodpecker, red-cockaded	*Picoides (=Dendrocopos) borealis*	U.S.A. (southcentral and southeastern)	do	E	2	NA	NA
Woodpecker, Tristram's	*Dryocopus javensis richardsi*	Korea	do	E	3	NA	
Wren, Guadeloupe house	*Troglodytes aedon guadeloupensis*	West Indies: Guadeloupe	do	E	3	NA	
Wren, St. Lucia house	*Troglodytes aedon mesoleucus*	West Indies: St. Lucia	do	E	3	NA	

Species: Common name	Species: Scientific name	Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
REPTILES							
Alligator, American	*Alligator mississippiensis*	Southeastern U.S.A.	Wherever found in wild except those areas where listed as threatened as set forth below	E	1, 11, 51, 60, 113, 134	NA	NA
Do	do	do	U.S.A. (FL and certain areas of GA and SC, as set forth in 17.42(a)(1))	T	20, 47, 51, 60, 134	NA	17.42(a)
Do	do	do	U.S.A. (LA and TX).	T(S/A)	11, 47, 51, 60, 113, 134	NA	17.42(a)
Do	do	do	In captivity wherever found	T(S/A)	11, 47, 51	NA	17.42(a)
Alligator, Chinese	*Alligator sinensis*	China	Entire	E	15	NA	NA
Anole, Culebra Island giant	*Anolis roosevelti*	U.S.A. (PR: Culebra Island)	do	E	25	17.95(c)	NA
Boa, Jamaican	*Epicrates subflavus*	Jamaica	do	E	3	NA	NA
Boa, Mona	*Epicrates monensis monensis*	U.S.A. (PR)	do	T	33	17.95(c)	NA
Boa, Puerto Rico	*Epicrates inornatus*	do	do	E	2	NA	NA
Boa, Round Island (no common name)	*Casarea dussumieri*	Indian Ocean: Mauritius	do	E	88	NA	NA
Boa, Round Island (no common name)	*Bolyeria multocarinata*	do	do	E	88	NA	NA
Boa, Virgin Islands tree	*Epicrates monensis granti*	U.S. and British Virgin Islands	do	E	2, 88	NA	NA
Caiman, Apaporis River	*Caiman crocodilus apaporiensis*	Colombia	do	E	15	NA	NA
Caiman, black	*Melanosuchus niger*	Amazon basin	do	E	15	NA	NA
Caiman, broad-snouted	*Caiman latirostris*	Brazil, Argentina, Paraguay, Uruguay	do	E	15	NA	NA
Caiman, Yacare	*Caiman cr[illegible]lus yacare*	Bolivia, Argentina, Peru, Brazil	do	E	3	NA	NA
Chuckwalla, San Esteban Island	*Sauromalus varius*	Mexico	do	E	88	NA	NA
Crocodile, African dwarf	*Osteolaemus tetraspis tetraspis*	West Africa	do	E	15	NA	NA
Crocodile, African slender-snouted	*Crocodylus cataphractus*	Western and central Africa	do	E	5	NA	NA
Crocodile, American	*Crocodylus acutus*	U.S.A. (FL), Mexico, South America, Central America, Caribbean.	do	E	10, 87	17.95(c)	NA
Crocodile, Ceylon mugger	*Crocodylus palustris kimbula*	Sri Lanka	do	E	15	NA	NA
Crocodile, Congo dwarf	*Osteolaemus tetraspis osborni*	Congo River drainage	do	E	15	NA	NA
Crocodile, Cuban	*Crocodylus rhombifer*	Cuba	do	E	3	NA	NA
Crocodile, Morelet's	*Crocodylus moreletii*	Mexico, Belize, Guatemala	do	E	3	NA	NA
Crocodile, mugger	*Crocodylus palustris palustris*	India, Pakistan, Iran, Bangladesh	do	E	15	NA	NA
Crocodile, Nile	*Crocodylus niloticus*	Africa	do	E	3	NA	NA
Crocodile, Orinoco	*Crocodylus intermedius*	South America: Orinoco River Basin	do	E	3	NA	NA
Crocodile, Philippine	*Crocodylus novaeguineae mindorensis*	Philippine Islands	do	E	15	NA	NA
Crocodile, saltwater (= estuarine)	*Crocodylus porosus*	Southeast Asia, Australia, Papua-New Guinea, Pacific Islands.	Entire, except Papua-New Guinea.	E	87	NA	NA
Crocodile, Siamese	*Crocodylus siamensis*	Southeast Asia, Malay Peninsula	Entire	E	15	NA	NA
Gavial (= gharial)	*Gavialis gangeticus*	Pakistan, Burma, Bangladesh, India, Nepal.	do	E	3, 15	NA	NA
Gecko, day	*Phelsuma edwardnewtoni*	Indian Ocean: Mauritius	do	E	3	NA	NA
Gecko, Monito	*Sphaerodactylus micropithecus*	U.S.A. (PR)	do	E	125	17.95(c)	NA
Gecko, Round Island day	*Phelsuma guentheri*	Indian Ocean: Mauritius	do	E	3	NA	NA
Gecko, Serpent Island	*Cyrtodactylus serpensinsula*						

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Iguana, Acklins ground	*Cyclura rileyi nuchalis*	West Indies: Bahamas	do	T	129	NA	NA
Iguana, Allen's Cay	*Cyclura cychlura inornata*	do	do	T	129	NA	NA
Iguana, Andros Island ground	*Cyclura cychlura cychlura*	do	do	T	129	NA	NA
Iguana, Anegada ground	*Cyclura pinguis*	West Indies: British Virgin Islands (Anegada Islands).	do	E	3	NA	NA
Iguana, Barrington land	*Conolophus pallidus*	Ecuador (Galapagos Islands)	do	E	3	NA	NA
Iguana, Cayman Brac ground	*Cyclura nubila caymanensis*	West Indies: Cayman Islands	do	T	129	NA	NA
Iguana, Cuban ground	*Cyclura nubila nubila*	Cuba	Entire (excluding population introduced in Puerto Rico).	T	129	NA	NA
Iguana, Exuma Island	*Cyclura cychlura figginsi*	West Indies: Bahamas	Entire	T	129	NA	NA
Iguana, Fiji banded	*Brachylophus fasciatus*	Pacific: Fiji, Tonga	do	E	88	NA	NA
Iguana, Fiji crested	*Brachylophus vitiensis*	Pacific: Fiji	do	E	88	NA	NA
Iguana, Grand Cayman ground	*Cyclura nubila lewisi*	West Indies: Cayman Islands	do	E	129	NA	NA
Iguana, Jamaican	*Cyclura collei*	West Indies: Jamaica	do	E	129	NA	NA
Iguana, Mayaguana	*Cyclura carinata bartschi*	West Indies: Bahamas	do	T	129	NA	NA
Iguana, Mona ground	*Cyclura stejnegeri*	U.S.A. (PR: Mona Island)	do	T	33	17.95(c)	NA
Iguana, Turks and Caicos	*Cyclura carinata carinata*	West Indies: Turks and Caicos Islands	do	T	129	NA	NA
Iguana, Watling Island ground	*Cyclura rileyi rileyi*	West Indies: Bahamas	do	E	129	NA	NA
Iguana, White Cay ground	*Cyclura rileyi cristata*	do	do	T	129	NA	NA
Lizard, blunt-nosed leopard	*Gambelia (=Crotaphytus) silus*	U.S.A. (CA)	do	E	1	NA	NA
Lizard, Coachella Valley fringe-toed	*Uma inornata*	do	do	T	105	17.95(c)	NA
Lizard, Hierro giant	*Gallotia simonyi simonyi*	Spain (Canary Islands)	do	E	144	NA	NA
Lizard, Ibiza wall	*Podarcis pityusensis*	Spain (Balearic Islands)	do	T	144	NA	NA
Lizard, island night	*Xantusia (=Klauberina) riversiana*	U.S.A. (CA)	do	T	26	NA	NA
Lizard, St. Croix ground	*Ameiva polops*	U.S.A. (VI)	do	E	24	17.95(c)	NA
Monitor, Bengal	*Varanus bengalensis*	Iran, Iraq, India, Sri Lanka, Malaysia, Afghanistan, Burma, Vietnam, Thailand.	do	E	15	NA	NA
Monitor, desert	*Varanus griseus*	North Africa to Neareast, Caspian Sea through U.S.S.R. to Pakistan, Northwest India.	do	E	15	NA	NA
Monitor, Komodo Island	*Varanus komodoensis*	Indonesia (Komodo, Rintja, Padar, and western Flores Island).	do	E	15	NA	NA
Monitor, yellow	*Varanus flavescens*	West Pakistan through India to Bangladesh.	do	E	15	NA	NA
Python, Indian	*Python molurus molurus*	Sri Lanka and India	do	E	15	NA	NA
Rattlesnake, Aruba Island	*Crotalus unicolor*	Aruba Island (Netherland Antilles)	do	T	129	NA	NA
Rattlesnake, New Mexican ridge-nosed	*Crotalus willardi obscurus*	U.S.A. (NM), Mexico	do	T	43	17.95(c)	NA
Skink, Round Island	*Leiolopisma telfairi*	Indian Ocean: Mauritius	do	T	129	NA	NA
Snake, Atlantic salt marsh	*Nerodia fasciata taeniata*	U.S.A. (FL)	do	T	30	NA	NA
Snake, eastern indigo	*Drymarchon corais couperi*	U.S.A. (AL, FL, GA, MS, SC)	do	T	32	NA	NA
Snake, San Francisco garter	*Thamnophis sirtalis tetrataenia*	U.S.A. (CA)	do	E	1	NA	NA
Tartaruga	*Podocnemis expansa*	South America: Orinoco and Amazon River basin.	do	E	3	NA	NA
Terrapin, river (=Tuntong)	*Batagur baska*	Malaysia, Bangladesh, Burma, India, Indonesia.	do	E	3	NA	NA
Tomistoma	*Tomistoma schlegelii*	Malaysia, Indonesia	do	E	15	NA	NA
Tortoise, angulated	*Geochelone yniphora*	Malagasy Republic (=Madagascar)	do	E	15	NA	NA
Tortoise, Bolson	*Gopherus flavomarginatus*	Mexico	do	E	46	NA	NA
Tortoise, desert	*Scaptochelys (=Gopherus) agassizii*	U.S.A. (UT, AZ, CA, NV), Mexico	Beaver Dam Slope, Utah	T	103	17.95(c)	NA

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Tortoise, G lapagos	*Geochelone elephantopus*	Ecuador (Galapagos Islands)	Entire	E	3	NA	NA
Tortoise, ra ated	*Geochelone (=Testudo) radiata*	Malagasy Republic (=Madagascar)	...do	E	3	NA	NA
Tracaja	*Podocnemis unifilis*	South America: Orinoco and Amazon River basins.	...do	E	3	NA	NA
Tuatara	*Sphenodon punctatus*	New Zealand	...do	E	3	NA	NA
Turtle, aqua c box	*Terrapene coahuila*	Mexico	...do	E	6	NA	NA
Turtle, black softshell	*Trionyx nigricans*	Bangladesh	...do	E	15	NA	NA
Turtle, Burm se peacock	*Morenia ocellata*	Burma	...do	E	15	NA	NA
Turtle, Cent al American river	*Dermatemys mawii*	Mexico, Belize, Guatemala	...do	E	129	NA	NA
Turtle, Cuat Cienegas softshell	*Trionyx ater*	Mexico	...do	E	15	NA	NA
Turtle, geom tric	*Psammobates geometricus (=Geochelone geometrica).*	South Africa	...do	E	15	NA	NA
Turtle, green sea	*Chelonia mydas*	Circumglobal in tropical and temperate seas and oceans.	Wherever found except where listed as endangered below.	T	2, 42	NA	17.42(b) and Parts 220 and 227.
Do	...do	...do	Breeding colony populations in FL and on Pacific coast of Mexico.	E	2, 42	NA	NA
Turtle, hawks ill sea (=carey)	*Eretmochelys imbricata*	Tropical seas	Entire	E	3	17.95(c)	NA
Turtle, Indian awback	*Kachuga tecta tecta*	India	...do	E	15	NA	NA
Turtle, Indian oftshell	*Trionyx gangeticus*	Pakistan, India	...do	E	15	NA	NA
Turtle, Kemp's (=Atlantic) Ridley sea	*Lepidochelys kempii*	Tropical and temperate seas in Atlantic Basin.	...do	E	4	NA	NA
Turtle, leather ack sea	*Dermochelys coriacea*	Tropical, temperate, and subpolar seas	...do	E	3	17.95(c), 226.71	NA
Turtle, loggerh ad sea	*Caretta caretta*	Circumglobal in tropical and temperate seas and oceans.	...do	T	42	NA	17.42(b) and Parts 220 and 227.
Turtle, Olive (P cific) Ridley sea	*Lepidochelys olivacea*	Tropical and temperate seas in Pacific Basin.	Wherever found except where listed as endangered below.	T	42	NA	17.42(b) and Parts 220 and 227
Do	...do	...do	Breeding colony populations on Pacific coast of Mexico.	E	42	NA	NA
Turtle, peacock softshell	*Trionyx hurum*	India, Bangladesh	Entire	E	15	NA	NA
Turtle, Plymouth red-bellied	*Pseudemys (=Chrysemys) rubriventris bangsi.*	U.S.A. (MA)	...do	E	90	17.95(c)	NA
Turtle, short-ne ked or western swamp	*Pseudemydura umbrina*	Australia	...do	E	3	NA	NA
Turtle, spotted pond	*Geoclemys (=Damonia) hamiltonii*	North India, Pakistan	...do	E	15	NA	NA
Turtle, three-ke led Asian	*Melanochelys (=Geoemyda, Nicoria) tricarinata.*	Central India to Bangladesh and Burma	...do	E	15	NA	NA
Viper, Lar Valle	*Vipera latifii*	Iran	...do	E	129	NA	NA
A IPHIBIANS							
Coqui, golden	*Eleutherodactylus jasperi*	U.S.A. (PR)	...do	T	29	17.95(d)	NA

Species: Common name	Species: Scientific name	Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Frog, Israel painted	*Discoglossus nigriventer*	Israel	do	E	3	NA	NA
Frog, Panamanian golden	*Atelopus varius zeteki*	Panama	do	E	15	NA	NA
Frog, Stephen Island	*Leiopelma hamiltoni*	New Zealand	do	E	3	NA	NA
Salamander, Chinese giant	*Andrias davidianus davidianus*	Western China	do	E	15	NA	NA
Salamander, desert slender	*Batrachoseps aridus*	U.S.A. (CA)	do	E	6	NA	NA
Salamander, Japanese giant	*Andrias davidianus japonicus*	Japan	do	E	15	NA	NA
Salamander, Red Hills	*Phaeognathus hubrichti*	U.S.A. (AL)	do	T	19	NA	NA
Salamander, San Marcos	*Eurycea nana*	U.S.A. (TX)	do	T	98	17.95(d)	17.43(a)
Salamander, Santa Cruz long-toed	*Ambystoma macrodactylum croceum*	U.S.A. (CA)	do	E	1	NA	NA
Salamander, Texas blind	*Typhlomolge rathbuni*	U.S.A. (TX)	do	E	1	NA	NA
Toad, African viviparous	*Nectophrynoides spp.*	Tanzania, Guinea, Ivory Coast, Cameroon, Liberia, Ethiopia.	do	E	15	NA	NA
Toad, Cameroon	*Bufo superciliaris*	Equatorial Africa	do	E	15	NA	NA
Toad, Houston	*Bufo houstonensis*	U.S.A. (TX)	do	E	2	17.95(d)	NA
Toad, Monte Verde	*Bufo periglenes*	Costa Rica	do	E	15	NA	NA
Toad, Wyoming	*Bufo hemiophrys baxteri*	U.S.A. (WY)	do	E	138	NA	NA
FISHES							
Ala Balik (trout)	*Salmo platycephalus*	Turkey	Entire	E	3	NA	NA
Ayumodoki (loach)	*Hymenophysa (=Botia) curta*	Japan	do	E	3	NA	NA
Blindcat, Mexican (catfish)	*Prietella phreatophila*	Mexico	do	E	3	NA	NA
Bonytongue, Asian	*Scleropages formosus*	Thailand, Indonesia, Malaysia	do	E	15	NA	NA
Catfish (no common name)	*Pangasius sanitwongsei*	Thailand	do	E	3	NA	NA
Catfish, giant	*Pangasianodon gigas*	do	do	E	3	NA	NA
Catfish, Yaqui	*Ictalurus pricei*	U.S.A. (AZ), Mexico	do	T	157	17.95(e)	17.44(g)
Cavefish, Alabama	*Speoplatyrhinus poulsoni*	U.S.A. (AL)	do	T	28	17.95(e)	NA
Cavefish, Ozark	*Amblyopsis rosae*	U.S.A. (AR, MO, OK)	do	T	164	NA	NA
Chub, bonytail	*Gila elegans*	U.S.A. (AZ, CA, CO, NV, UT, WY)	do	E	92	NA	NA
Chub, Borax Lake	*Gila boraxobius*	U.S.A. (OR)	do	E	124	17.95(e)	NA
Chub, Chihuahua	*Gila nigrescens*	U.S.A. (NM), Mexico (Chihuahua)	do	T	132	NA	17.44(g)
Chub, humpback	*Gila cypha*	U.S.A. (AZ, CO, UT, WY)	do	E	1	NA	NA
Chub, Hutton tui	*Gila bicolor ssp.*	U.S.A. (OR)	do	T	174	NA	17.44(j)
Chub, Mohave tui	*Gila bicolor mohavensis*	U.S.A. (CA)	do	E	2	NA	NA
Chub, Owens tui	*Gila bicolor snyderi*	do	do	E	195	17.95(e)	NA
Chub, Pahranagat roundtail	*Gila robusta jordani*	U.S.A. (NV)	do	E	2	NA	NA
Chub, slender	*Hybopsis cahni*	U.S.A. (TN, VA)	do	T	28	17.95(e)	17.44(c)
Chub, spotfin	*Hybopsis monacha*	U.S.A. (AL, GA, NC, TN, VA)	do	T	28	17.95(e)	17.44(c)
Chub, Yaqui	*Gila purpurea*	U.S.A. (AZ), Mexico	do	E	157	17.95(e)	NA
Cicek (minnow)	*Acanthorutilus handlirschi*	Turkey	do	E	3	NA	NA
Cui-ui	*Chasmistes cujus*	U.S.A. (NV)	do	E	1	NA	NA
Dace, Ash Meadows speckled	*Rhinichthys osculus nevadensis*	do	do	E	117E, 127E, 130	17.95(e)	NA
Dace, desert	*Eremichthys acros*	do	do	T	210	17.95(e)	17.44(m)
Dace, Foskett speckled	*Rhinichthys osculus ssp.*	U.S.A. (OR)	do	T	174	NA	17.44(j)
Dace, Kendall Warm Springs	*Rhinichthys osculus thermalis*	U.S.A. (WY)	do	E	2	NA	NA
Dace, Moapa	*Moapa coriacea*	U.S.A. (NV)	do	E	1	NA	NA
Darter, amber	*Percina antesella*	U.S.A. (GA, TN)	do	E	196	17.95(e)	NA
Darter, bayou	*Etheostoma rubrum*	U.S.A. (MS)	do	T	10	NA	17.44(b)
Darter, fountain	*Etheostoma fonticola*	U.S.A. (TX)	do	E	2	17.95(e)	NA
Darter, leopard	*Percina pantherina*	U.S.A. (AR, OK)	do	T	31	17.95(e)	17.44(d)
Darter, Maryland	*Etheostoma sellare*	U.S.A. (MD)	do	E	1	NA	NA
Darter, Niangua	*Etheostoma nianguae*	U.S.A. (MO)	do	T	185	17.95(e)	17.44(h)

Species: Common name	Species: Scientific name	Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Darter, Okaloosa	*Etheostoma okaloosae*	U.S.A. (FL)	do	E	6	NA	NA
Darter, slackwater	*Etheostoma boschungi*	U.S.A. (AL, TN)	do	T	28	17.95(e)	17.44(c)
Darter, snail	*Percina tanasi*	U.S.A. (AL, GA, TN)	do	T	12, 150	NA	NA
Darter, watercress	*Etheostoma nuchale*	U.S.A. (AL)	do	E	2	NA	NA
Gambusia, Big Bend	*Gambusia gaigei*	U.S.A. (TX)	do	E	1	NA	NA
Gambusia, Clear Creek	*Gambusia heterochir*	do	do	E	1	NA	NA
Gambusia, Amistad	*Gambusia amistadensis*	do	do	E	93	NA	NA
Gambusia, Pecos	*Gambusia nobilis*	U.S.A. (NM, TX)	do	E	2	NA	NA
Gambusia, San Marcos	*Gambusia georgei*	U.S.A. (TX)	do	E	98	17.95(e)	NA
Killifish, Pahrump	*Empetrichthys latos*	U.S.A. (NV)	do	E	1	NA	NA
Logperch, Conasauga	*Percina jenkinsi*	U.S.A. (GA, TN)	do	E	196	17.95(e)	NA
Madtom, Scioto	*Noturus trautmani*	U.S.A. (OH)	do	E	10	NA	NA
Madtom, Smoky	*Noturus baileyi*	U.S.A. (TN)	do	E	163	17.95(e)	NA
Madtom, yellowfin	*Noturus flavipinnis*	U.S.A. (GA, TN, VA)	do	T	28	17.95(e)	17.44(c)
Nekogigi (catfish)	*Coreobagrus ichikawai*	Japan	do	E	3	NA	NA
Pupfish, Ash Meadows Amargosa	*Cyprinodon nevadensis mionectes*	U.S.A. (NV)	do	E	117E, 127E, 130	17.95(e)	NA
Pupfish, Comanche Springs	*Cyprinodon elegans*	U.S.A. (TX)	do	E	1	NA	NA
Pupfish, Devils Hole	*Cyprinodon diabolis*	U.S.A. (NV)	do	E	1	NA	NA
Pupfish, Leon Springs	*Cyprinodon bovinus*	U.S.A. (TX)	do	E	102	17.95(e)	NA
Pupfish, Owens	*Cyprinodon radiosus*	U.S.A. (CA)	do	E	1	NA	NA
Pupfish, Warm Springs	*Cyprinodon nevadensis pectoralis*	U.S.A. (NV)	do	E	2	NA	NA
Shiner, beautiful	*Notropis formosus*	U.S.A. (AZ, NM), Mexico	do	T	157	17.95(e)	17.44(g)
Spinedace, Big Spring	*Lepidomeda mollispinis pratensis*	U.S.A. (NV)	do	T	173	17.95(e)	17.44(i)
Spinedace, White River	*Lepidomeda albivallis*	do	do	E	203	17.95(e)	NA
Springfish, Hiko White River	*Crenichthys baileyi grandis*	do	do	E	206	17.95(e)	NA
Springfish, White River	*Crenichthys baileyi baileyi*	do	do	E	206	17.95(e)	NA
Squawfish, Colorado	*Ptychocheilus lucius*	U.S.A. (AZ, CA, CO, NM, NV, UT, WY), Mexico.	Entire, except Salt and Verde R. drainages, AZ.	E	1, 193	NA	NA
Do	do	do	Salt and Verde R drainages, AZ.	XN	193	NA	17.84(b)
Stickleback, unarmored threespine	*Gasterosteus aculeatus williamsoni*	U.S.A. (CA)	do	E	2	NA	NA
Sturgeon, shortnose	*Acipenser brevirostrum*	U.S.A. and Canada (Atlantic Coast)	do	E	1	NA	NA
Sucker, Modoc	*Catostomus microps*	U.S.A. (CA)	do	E	184	17.95(e)	NA
Sucker, Warner	*Catostomus warnerensis*	U.S.A. (OR)	do	T	205	17.95(e)	17.44(l)
Tango, Miyako (Tokyo bitterling)	*Tanakia tanago*	Japan	do	E	3	NA	NA
Temolek, Ikan (minnow)	*Probarbus jullieni*	Thailand, Cambodia, Vietnam, Malaysia, Laos.	do	E	15	NA	NA
Topminnow, Gila	*Poeciliopsis occidentalis*	U.S.A. (AZ, NM), Mexico	do	E	1	NA	NA
Totoaba (seatrout or weakfish)	*Cynoscion macdonaldi*	Mexico (Gulf of California)	do	E	45	NA	NA
Trout, Apache	*Salmo apache*	U.S.A. (AZ)	do	T	1, 8	NA	17.44(a)
Trout, Gila	*Salmo gilae*	U.S.A. (AZ, NM)	do	E	1	NA	NA
Trout, greenback cutthroat	*Salmo clarki stomias*	U.S.A. (CO)	do	T	1, 38	NA	17.44(f)
Trout, Lahontan cutthroat	*Salmo clarki henshawi*	U.S.A. (CA, NV)	do	T	2, 8	NA	17.44(a)
Trout, Little Kern golden	*Salmo aguabonita whitei*	U.S.A. (CA)	do	T	37	17.95(e)	17.44(e)
Trout, Paiute cutthroat	*Salmo clarki seleniris*	do	do	T	1, 8	NA	17.44(a)
Woundfin	*Plagopterus argentissimus*	U.S.A. (AZ, NV, UT)	Entire, except Gila R. drainage, AZ, NM.	E	2, 193	NA	NA

Species		Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
Common name	Scientific name						
Woundfin	*Plagopterus argentissimus*	U.S.A. (AZ, NV, UT)	Gila R. drainage AZ, NM.	XN	193	NA	17.84(b)
SNAILS							
Snail, Chittenango ovate amber	*Succinea chittenangoensis*	U.S.A. (NY)	NA	T	41	NA	NA
Snail, flat-spired three-toothed	*Triodopsis platysayoides*	U.S.A. (WV)	NA	T	41	NA	NA
Snail, Iowa Pleistocene	*Discus macclintocki*	U.S.A. (IA)	NA	E	41	NA	NA
Snail, Manus Island tree	*Papustyla pulcherrima*	Pacific Ocean: Admiralty Is. (Manus Is.)	NA	E	3	NA	NA
Snail, noonday	*Mesodon clarki nantahala*	U.S.A. (NC)	NA	T	41	NA	NA
Snail, Oahu tree	*Achatinella* spp. (all species)	U.S.A. (HI)	NA	E	108, 112	NA	NA
Snail, painted snake coiled forest	*Anguispira picta*	U.S.A. (TN)	NA	T	41	NA	NA
Snail, Stock Island	*Orthalicus reses*	U.S.A. (FL)	NA	T	41	NA	NA
Snail, Virginia fringed mountain	*Polygyriscus virginianus*	U.S.A. (VA)	NA	E	41	NA	NA
CLAMS							
Pearly mussel, Alabama lamp	*Lampsilis virescens*	U.S.A. (AL, TN)	NA	E	15	NA	NA
Pearly mussel, Appalachian monkeyface	*Quadrula sparsa*	U.S.A. (TN, VA)	NA	E	15	NA	NA
Pearly mussel, birdwing	*Conradilla caelata*	do	NA	E	15	NA	NA
Pearly mussel, Cumberland bean	*Villosa (=Micromya) trabalis*	U.S.A. (KY, TN)	NA	E	15	NA	NA
Pearly mussel, Cumberland monkeyface	*Quadrula intermedia*	U.S.A. (AL, TN, VA)	NA	E	15	NA	NA
Pearly mussel, Curtis'	*Epioblasma (=Dysnomia) florentina curtisi.*	U.S.A. (MO)	NA	E	15	NA	NA
Pearly mussel, dromedary	*Dromus dromas*	U.S.A. (TN, VA)	NA	E	15	NA	NA
Pearly mussel, green-blossom	*Epioblasma (=Dysnomia) torulosa gubernaculum.*	do	NA	E	15	NA	NA
Pearly mussel, Higgins' eye	*Lampsilis higginsi*	U.S.A. (IL, IA, MN, MO, NE, WI)	NA	E	15	NA	NA
Pearly mussel, Nicklin's	*Megalonaias nicklineana*	Mexico	NA	E	15	NA	NA
Pearly mussel, orange-footed	*Plethobasus cooperianus*	U.S.A. (AL, IN, IA, KY, OH, PA, TN)	NA	E	15	NA	NA
Pearly mussel, pale lilliput	*Toxolasma (=Carunculina) cylindrellus*	U.S.A. (AL, TN)	NA	E	15	NA	NA
Pearly mussel, pink mucket	*Lampsilis orbiculata*	U.S.A. (AL, IL, IN, KY, MO, OH, PA, TN, WV).	NA	E	15	NA	NA
Pearly mussel, Tampico	*Cyrtonaias tampicoensis tecomatensis*	Mexico	NA	E	15	NA	NA
Pearly mussel, tubercled-blossom	*Epioblasma (=Dysnomia) torulosa torulosa.*	U.S.A. (IL, IN, KY, TN, WV)	NA	E	15	NA	NA
Pearly mussel, turgid-blossom	*Epioblasma (=Dysnomia) turgidula*	U.S.A. (AL, TN)	NA	E	15	NA	NA
Pearly mussel, white cat's paw	*Epioblasma (=Dysnomia) sulcata delicata.*	U.S.A. (IN, MI, OH)	NA	E	15	NA	NA
Pearly mussel, white wartyback	*Plethobasus cicatricosus*	U.S.A. (AL, IN, TN)	NA	E	15	NA	NA
Pearly mussel, yellow-blossom	*Epioblasma (=Dysnomia) florentina florentina.*	U.S.A. (AL, TN)	NA	E	15	NA	NA
Pigtoe, fine-rayed	*Fusconaia cuneolus*	U.S.A. (AL, TN, VA)	NA	E	15	NA	NA
Pigtoe, rough	*Pleurobema plenum*	U.S.A. (IN, KY, TN, VA)	NA	E	15	NA	NA
Pigtoe, shiny	*Fusconaia edgariana*	U.S.A. (AL, TN, VA)	NA	E	15	NA	NA
Pocketbook, fat	*Potamilus (=Proptera) capax*	U.S.A. (AR, IN, MO, OH)	NA	E	15	NA	NA
Riffle shell, tan	*Epioblasma walkeri*	U.S.A. (KY, TN, VA)	NA	E	27	NA	NA
Spiny mussel, Tar River	*Elliptio (=Canthyria) steinstansana*	U.S.A. (NC)	NA	E	188	NA	NA
CRUSTACEANS							
Amphipod, Hay's Spring	*Stygobromus hayi*	U.S.A. (DC)	NA	E	115	NA	NA
Isopod, Madison Cave	*Antrolana lira*	U.S.A. (VA)	NA	T	123	NA	17.46(a)
Isopod, Socorro	*Thermosphaeroma (=Exosphaeroma) thermophilus.*	U.S.A. (NM)	NA	E	38	NA	NA
Shrimp, Kentucky cave	*Palaemonias ganteri*	U.S.A. (KY)	NA	E	135	17.95(h)	NA

Species: Common name	Species: Scientific name	Historic range	Vertebrate population where endangered or threatened	Status	When listed	Critical habitat	Special rules
INSECTS							
Beetle, delta green ground	*Elaphrus viridis*	U.S.A. (CA)	NA	T	100	17.95(i)	NA
Beetle, valley elderberry longhorn	*Desmocerus californicus dimorphus*	do	NA	T	99	17.95(i)	NA
Butterfly, El Segundo blue	*Euphilotes (=Shijimiaeoides) battoides allyni.*	do	NA	E	14	NA	NA
Butterfly, Lange's metalmark	*Apodemia mormo langei*	do	NA	E	14	NA	NA
Butterfly, lotis blue	*Lycaeides argyrognomon lotis*	do	NA	E	14	NA	NA
Butterfly, mission blue	*Icaricia icarioides missionensis*	do	NA	E	14	NA	NA
Butterfly, Oregon silverspot	*Speyeria zerene hippolyta*	U.S.A. (OR, WA)	NA	T	95	17.95(i)	NA
Butterfly, Palos Verdes blue	*Glaucopsyche lygdamus palosverdesensis.*	U.S.A. (CA)	NA	E	98	17.95(i)	NA
Butterfly, San Bruno elfin	*Callophrys mossii bayensis*	do	NA	E	14	NA	NA
Butterfly, Schaus swallowtail	*Heraclides (Papilio) aristodemus ponceanus.*	U.S.A. (FL)	NA	E	13,159	NA	NA
Butterfly, Smith's blue	*Euphilotes (=Shijimiaeoides) enoptes smithi.*	U.S.A. (CA)	NA	E	14	NA	NA
Moth, Kern primrose sphinx	*Euproserpinus euterpe*	do	NA	T	91	NA	NA
Naucorid, Ash Meadows	*Ambrysus amargosus*	U.S.A. (NV)	NA	T	181	17.95(i)	NA

EDITORIAL NOTE: For "When listed" citations, see list following; for symbols in "When listed" see below:
#—Indicates FR where species was delisted; relisting of the species is indicated by subsequent number(s).
E—Indicates Emergency rule publication (see FR document for effective dates); subsequent number(s) indicate FR final rule, if applicable under "when listed."

1—32 FR 4001: March 11, 1967.
2—35 FR 16047: October 13, 1970.
3—35 FR 8496: June 2, 1970.
4—35 FR 18320: December 2, 1970.
5—37 FR 6476: March 30, 1972.
6—38 FR 14678: June 4, 1973.
7—39 FR 44991: December 30, 1974.
8—40 FR 29864: July 16, 1975.
9—40 FR 31736: July 28, 1975.
10—40 FR 44151: September 25, 1975.
11—40 FR 44418: September 26, 1975.
12—40 FR 47508: October 9, 1975.
13—41 FR 17740: April 28, 1976.
14—41 FR 22044: June 1, 1976.
15—41 FR 24064: June 14, 1976.
16—41 FR 45993: October 19, 1976.
17—41 FR 51021: November 19, 1976.
18—41 FR 51612: November 23, 1976.
19—41 FR 53034: December 3, 1976.
20—42 FR 2076: January 10, 1977.
21—42 FR 2968: January 14, 1977.
23—42 FR 28137: June 2, 1977.
24—42 FR 28546: June 3, 1977.
25—42 FR 37373: July 21, 1977.
26—42 FR 40686: August 11, 1977.
27—42 FR 42353: August 23, 1977.
28—42 FR 45528: September 9, 1977.
29—42 FR 58755: November 11, 1977.
30—42 FR 60746: November 29, 1977.
31—43 FR 3715: January 27, 1978.
32—43 FR 4028: January 31, 1978.
33—43 FR 4621: February 3, 1978.
34—43 FR 6233: February 14, 1978.
35—43 FR 9612: March 9, 1978.
36—43 FR 12691: March 27, 1978.
37—43 FR 15429: April 13, 1978.
38—43 FR 16348: April 18, 1978.
40—43 FR 20[illegible]: May 12, 1978.
41—43 FR 28932: July 3, 1978.
42—43 FR 32808: July 28, 1978.
43—43 FR 34479: August 4, 1978.
45—44 FR 21289: April 10, 1979.
46—44 FR 23064: April 17, 1979.
48—44 FR 29480: May 21, 1979.
50—44 FR 37126: June 25, 1979.
51—44 FR 37132: June 25, 1979.
52—44 FR 42911: July 20, 1979.
54—44 FR 49220: August 21, 1979.
55—44 FR 54007: September 17, 1979.
60—44 FR 59084: October 12, 1979.
65—44 FR 69208: November 30, 1979.
66—44 FR 70677: December 7, 1979.
67—44 FR 75076: December 18, 1979.
68—45 FR 18010: March 20, 1980.
90—45 FR 21833: April 2, 1980.
91—45 FR 24090: April 8, 1980.
92—45 FR 27713: April 23, 1980.
93—45 FR 28722: April 30, 1980.
94—45 FR 35821: May 28, 1980.
95—45 FR 44935: July 2, 1980.
96—45 FR 44939: July 2, 1980.
97—45 FR 47352: July 14, 1980.
98—45 FR 47355: July 14, 1980.
99—45 FR 52803: August 8, 1980.
100—45 FR 52807: August 8, 1980.
102—45 FR 54678: August 15, 1980.
103—45 FR 55654: August 20, 1980.
105—45 FR 63812: September 25, 1980.
106—45 FR 65132: October 1, 1980.
108—46 FR 3178: January 13, 1981.
111—46 FR 11666: February 10, 1981.
112—46 FR 40025: August 6, 1981.
113—46 FR 40664: August 10, 1981.
114—47 FR 4204: January 28, 1982.
115—47 FR 5425: February 5, 1982.
117—47 FR 19996: May 10, 1982.
119—47 FR 31670: July 21, 1982.
123—47 FR 43701: October 4, 1982.
124—47 FR 43962: October 5, 1982.
125—47 FR 46093: October 15, 1982.
127—48 FR 612: January 5, 1983.
128—48 FR 1726: January 14, 1983.
129—48 FR 28464: June 22, 1983.
130—48 FR 40184: September 2, 1983.
131—48 FR 43043: September 21, 1983.
132—48 FR 46057: October 11, 1983.
134—48 FR 46336: October 12, 1983.
135—48 FR 46341: October 12, 1983.
136—48 FR 49249: October 25, 1983.
137—49 FR 1058: January 9, 1984.
138—49 FR 1994: January 17, 1984.
139—49 FR 2783: January 23, 1984.
142—49 FR 7335: February 28, 1984.
143—49 FR 7394: February 29, 1984.
144—49 FR 7398: February 29, 1984.
145—49 FR 10526: March 20, 1984.
146—49 FR 14356: April 11, 1984.
149—49 FR 22334: May 29, 1984.
150—49 FR 27514: July 5, 1984.
156—49 FR 33888: August 27, 1984.
157—49 FR 34494: August 31, 1984.
159—49 FR 34504: August 31, 1984.
160—49 FR 34510: August 31, 1984.
161—49 FR 35954: September 13, 1984.
163—49 FR 43069: October 26, 1984.
164—49 FR 43969: November 1, 1984.
166—49 FR 45163: November 15, 1984.
168—49 FR 49639: December 21, 1984.
169—50 FR 1056: January 9, 1985.
170—50 FR 4226: January 30, 1985.
171—50 FR 4945: February 4, 1985.
173—50 FR 12302: March 28, 1985.
174—50 FR 12306: March 28, 1985.
181—50 FR 20785: May 20, 1985.
182—50 FR 21792: May 28, 1985.
183—50 FR 23884: June 6, 1985.
184—50 FR 24530: June 11, 1985.
185—50 FR 24653: June 12, 1985.
186—50 FR 25676: June 20, 1985.
188—50 FR 26573: June 27, 1985.
189—50 FR 27002: July 1, 1985.
193—50 FR 30194: July 24, 1985.
195—50 FR 31596: August 5, 1985.
196—50 FR 31603: August 5, 1985.
203—50 FR 37199: September 12, 1985.
205—50 FR 39117: September 27, 1985.
206—50 FR 39123: September 27, 1985.
210—50 FR 50308: December 10, 1985.
211—50 FR 50733: December 11, 1985.
212—50 FR 51252: December 18, 1985.

[48 FR 34182, July 27, 1983; 48 FR 34961, Aug. 2, 1983, as amended at 48 FR 39943, Sept. 2, 1983; 48 FR 46337, Oct. 12, 1983; 48 FR 52743, Nov. 22, 1983; 49 FR 1058, Jan. 9, 1984; 49 FR 33892, Aug. 27, 1984]

Editorial Note: *For additional* **Federal Register** *citations affecting the table in § 17.11(h), see the listing which follows the table.*

§ 17.12 Endangered and threatened plants.

(a) The list in this section contains the names of all species of plants which have been determined by the Services to be Endangered or Threatened. It also contains the names of species of plants treated as Endangered or Threatened because they are sufficiently similar in appearance to Endangered or Threatened species (see § 17.50 *et seq.*).

(b) The columns entitled "Scientific Name" and "Common Name" define the species of plant within the meaning of the Act. Although common names are included, they cannot be relied upon for identification of any specimen, since they may vary greatly in local usage. The Services shall use the most recently accepted scientific name. In cases in which confusion might arise, a synonym(s) will be provided in parentheses. The Services shall rely to the extent practicable on the *International Code of Botanical Nomenclature.*

(c) In the "Status" column the following symbols are used: "E" for Endangered, "T" for Threatened, and "E [or T] (S/A)" for similarity of appearance species.

(d) The other data in the list are nonregulatory in nature and are provided for the information of the reader. In the annual revision and compilation of this Title, the following information may be amended without public notice: the spelling of species' names, historical range, footnotes, references to certain other appli portions of this Title, synonyms, more current names. In any of these revised entries, neither the species, as defined in paragraph (b) of this section, nor its status may be changed without following the procedures of Part 424 of this Title.

(e) The "Historic Range" indicates the known general distribution of the species or subspecies as reported in the current scientific literature. The present distribution may be greatly reduced from this historic range. This column does not imply any limitation on the application of the prohibitions in the Act or implementing rules. Such prohibitions apply to all individuals of the plant species, wherever found.

(f)(1) A footnote to the **Federal Register** publication(s) listing or reclassifying a species is indicated under the column "When Listed." Footnote numbers to §§ 17.11 and 17.12 are in the same numerical sequence, since plants and animals may be listed in the same **Federal Register** document. That document, at least since 1973, includes a statement indicating the basis for the listing, as well as the effective date(s) of said listing.

(2) The "Special Rules" and "Critical Habitat" columns provide a cross reference to other sections in Parts 17, 222, 226, or 227. The "Special Rules" column will also be used to cite the special rules which describe experimental populations and determine if they are essential or nonessential. Separate listings will be made for

experimental populations, and the status column will include the following symbols: "XE" for an essential experimental population and "XN" for a nonessential experimental population. The term "NA" (not applicable) appearing in either of these two columns indicates that there are no special rules and/or critical habitat for that particular species. However, all other appropriate rules in Parts 17, 217–227, and 402 still apply to that species. In addition, there may be other rules in this Title that relate to such plants, e.g., port-of-entry requirements. It is not intended that the references in the "Special Rules" column list all the regulations of the two Services which might apply to the species or to the regulations of other Federal agencies or State or local governments.

(g) The listing of a particular taxon includes all lower taxonomic units (see § 17.11(g) for examples).

(h) The "List of Endangered and Threatened Plants" is provided below:

Species: Scientific name	Species: Common name	Historic range	Status	When listed	Critical habitat	Special rules
Agavaceae—Agave family						
Agave arizonica	Arizona agave	U.S.A. (AZ)	E	147	NA	NA
Alismataceae—Water-plantain family:						
Sagittaria fasciculata	Bunched arrowhead	U.S.A. (NC, SC)	E	53	NA	NA
Apiaceae—Parsley family						
Eryngium constancei	Loch Lomond coyote-thistle	U.S.A. (CA)	E	194E	NA	NA
Asteraceae—Aster family:						
Bidens cuneata	Cuneate bidens	U.S.A. (HI)	E	141	NA	NA
Dyssodia tephroleuca	Ashy dogweed	U.S.A. (TX)	E	152	NA	NA
Echinacea tennesseensis	Tennessee purple coneflower	U.S.A. (TN)	E	49	NA	NA
Enceliopsis nudicaulis var. corrugata	Ash Meadows sunray	U.S.A. (NV)	T	181	17.96(a)	NA
Erigeron maguirei var. maguirei	Maguire daisy	U.S.A. (UT)	E	202	NA	NA
Erigeron rhizomatus	Rhizome fleabane	U.S.A. (NM)	T	177	NA	NA
Grindelia fraxinopratensis	Ash Meadows gumplant	U.S.A. (CA, NV)	T	181	17.96(a)	NA
Lipochaeta venosa	None	U.S.A. (HI)	E	73	NA	NA
Pityopsis ruthii (=Heterotheca ruthii, =Chrysopsis ruthii)	Ruth's golden aster	U.S.A. (TN)	E	191	NA	NA
Senecio franciscanus	San Francisco Peaks groundsel	U.S.A. (AZ)	T	137	17.96(a)	NA
Solidago shortii	Short's goldenrod	U.S.A. (KY)	E	201	NA	NA
Solidago spithamaea	Blue Ridge goldenrod	U.S.A. (NC, TN)	T	175	NA	NA
Stephanomeria malheurensis	Malheur wire-lettuce	U.S.A. (OR)	E	126	17.96(a)	NA
Townsendia aprica	Last Chance townsendia	U.S.A. (UT)	T	200	NA	NA
Berberidaceae—Barberry family:						
Mahonia sonnei (=Berberis s.)	Truckee barberry	U.S.A. (CA)	E	76	NA	NA
Betulaceae—Birch family:						
Betula uber	Virginia round-leaf birch	U.S.A. (VA)	E	39	NA	NA
Boraginaceae—Borage family:						
Amsinckia grandiflora	Large-flowered fiddleneck	U.S.A. (CA)	E	179	17.96(a)	NA
Brassicaceae—Mustard family:						
Arabis mcdonaldiana	McDonald's rock-cress	U.S.A. (CA)	E	44	NA	NA
Erysimum capitatum var. angustatum	Contra Costa wallflower	do	E	39	17.96(a)	NA
Thelypodium stenopetalum	Slender-petaled mustard	do	E	158	NA	NA
Buxaceae—Boxwood family:						
Buxus vahlii	Vahl's boxwood	U.S.A. (PR)	E	197	NA	NA
Cactaceae—Cactus family:						
Ancistrocactus tobuschii (=Echinocactus t., Mammillaria t.)	Tobusch fishhook cactus	U.S.A. (TX)	E	80	NA	NA
Cereus eriophorus var. fragrans	Fragrant prickly-apple	U.S.A. (FL)	E	208	NA	NA
Cereus robinii	Key tree-cactus	U.S.A. (FL), Cuba	E	153	NA	NA
Coryphantha minima (=C. nellieae, Escobaria n., Mammillaria n.).	Nellie cory cactus	U.S.A. (TX)	E	81	NA	NA
Coryphantha ramillosa	Bunched cory cactus	U.S.A. (TX), Mexico (Coahuila).	T	77	NA	NA
Coryphantha sneedii var. leei (=Escobaria l., Mammillaria l.)	Lee pincushion cactus	U.S.A. (NM)	T	81	NA	NA
Coryphantha sneedii var. sneedii (=Escobaria s., Mammillaria s.).	Sneed pincushion cactus	U.S.A. (TX, NM)	E	82	NA	NA
Echinocactus horizonthalonius var. nicholii	Nichol's Turk's head cactus	U.S.A. (AZ)	E	71	NA	NA
Echinocereus engelmannii var. purpureus	Purple-spined hedgehog cact	U.S.A. (UT)	E	58	NA	NA
Echinocereus fendleri var. kuenzleri (=E. kuenzleri, E. hempelii of authors, not Fobe).	Kuenzler hedgehog cactus	U.S.A. (NM)	E	70	NA	NA
Echinocereus lloydii (=E. roetteri var. l.)	Lloyd's hedgehog cactus	U.S.A. (TX)	E	67	NA	NA

Species: Scientific name	Species: Common name	Historic range	Status	When listed	Critical habitat	Special rules
Echinocereus reichenbachii var. *albertii* (= *E. melanocentrus*)	Black lace cactus	do	E	68	NA	NA
Echinocereus triglochidiatus var. *arizonicus* (= *E. arizonicus*)	Arizona hedgehog cactus	U.S.A. (AZ)	E	62	NA	NA
Echinocereus triglochidiatus var. *inermis* (= *E. coccineus* var. *i.*, *E. phoeniceus* var. *i.*).	Spineless hedgehog cactus	U.S.A. (CO, UT)	E	83	NA	NA
Echinocereus viridiflorus var. *davisii* (= *E. davisii*)	Davis' green pitaya	U.S.A. (TX)	E	81	NA	NA
Neolloydia mariposensis (= *Echinocactus m.*, *Echinomastus m.*).	Lloyd's Mariposa cactus	U.S.A. (TX), Mexico (Coahuila).	T	77	NA	NA
Pediocactus bradyi (= *Toumeya b.*)	Brady pincushion cactus	U.S.A. (AZ)	E	63	NA	NA
Pediocactus knowltonii (= *P. bradyi* var. *k.* *Toumeya k.*)	Knowlton cactus	U.S.A. (NM, CO)	E	72	NA	NA
Pediocactus peeblesianus var. *peeblesianus* (= *Echinocactus p.*, *Navajoa p.*, *Toumeya p.*, *Utahia p.*).	Peebles Navajo cactus	U.S.A. (AZ)	E	69	NA	NA
Pediocactus sileri (= *Echinocactus s.*, *Utahia s.*)	Siler pincushion cactus	U.S.A. (AZ, UT)	E	64	NA	NA
Sclerocactus glaucus (= *Echinocactus g.*, *E. subglaucus*, *E. whipplei* var. *g.*, *Pediocactus g.*, *S. franklinii*, *S. whipplei* var. *g.*).	Uinta Basin hookless cactus	U.S.A. (CO, UT)	T	59	NA	NA
Sclerocactus mesae-verdae (= *Coloradoa m.*, *Echinocactus m.*, *Pediocactus m.*).	Mesa Verde cactus	U.S.A. (CO, NM)	T	75	NA	NA
Sclerocactus wrightiae (= *Pediocactus w.*)	Wright fishhook cactus	U.S.A. (UT)	E	58	NA	NA
Caryophyllaceae—Pink family:						
Schiedea adamantis	Diamond Head schiedea	U.S.A. (HI)	E	141	NA	NA
Chenopodiaceae—Goosefoot family:						
Nitrophila mohavensis	Amargosa niterwort	U.S.A. (CA)	E	181	17.96(a)	NA
Cistaceae—Rockrose family:						
Hudsonia montana	Mountain golden heather	U.S.A. (NC)	T	107	17.96(a)	NA
Crassulaceae—Stonecrop family:						
Dudleya traskiae	Santa Barbara Island liveforever	U.S.A. (CA)	E	39	NA	NA
Cupressaceae—Cypress family:						
Fitzroya cupressoides	Chilean false larch (= alerce)	Chile, Argentina	T	79	NA	NA
Cyperaceae—Sedge family:						
Carex specuicola	None	U.S.A. (AZ)	T	178	17.96(a)	NA
Ericaceae—Heath family:						
Arctostaphylos pungens var. *ravenii* (= *A. hookeri* ssp. *ravenii*).	Presidio (= Raven's) manzanita	U.S.A. (CA)	E	65	NA	NA
Rhododendron chapmanii	Chapman rhododendron	U.S.A. (FL)	E	47	NA	NA
Euphorbiaceae—Spurge family:						
Euphorbia (= *Chamaesyce*) *deltoidea* ssp. *deltoidea*	Spurge	U.S.A. (FL)	E	192	NA	NA
Euphorbia (= *Chamaesyce*) *garberi*	None	do	T	192	NA	NA
Euphorbia skottsbergii var. *kalaeloana*	Ewa Plains 'akoko	U.S.A. (HI)	E	120	NA	NA
Jatropha costaricensis	Costa Rican jatropha	Costa Rica	E	154	NA	NA
Fabaceae—Pea family:						
Amorpha crenulata	Crenulate lead-plant	U.S.A. (FL)	E	192	NA	NA
Astragalus humillimus	Mancos milk-vetch	U.S.A. (CO, NM)	E	187	NA	NA
Astragalus perianus	Rydberg milk-vetch	U.S.A. (UT)	T	39	NA	NA
Astragalus phoenix	Ash Meadows milk-vetch	U.S.A. (NV)	T	181	17.96(a)	NA
Baptisia arachnifera	Hairy rattleweed	U.S.A. (GA)	E	39	NA	NA
Galactia smallii	Small's milkpea	U.S.A. (FL)	E	192	NA	NA
Hoffmannseggia tenella	Slender rush-pea	U.S.A. (TX)	E	207	NA	NA
Lotus dendroideus ssp. *traskiae* (= *L. scoparius* ssp. *t.*)	San Clemente Island broom	U.S.A. (CA)	E	26	NA	NA

Species: Scientific name	Species: Common name	Historic range	Status	When listed	Critical habitat	Special rules
Vicia menziesii	Hawaiian vetch	U.S.A. (HI)	E	39	NA	NA
Frankeniaceae—Frankenia family:						
Frankenia johnstonii	Johnston's frankenia	U.S.A. (TX), Mexico (Nuevo Leon).	E	155	NA	NA
Gentianaceae—Gentian family:						
Centaurium namophilum	Spring-loving centaury	U.S.A. (CA, NV)	T	181	17.96(a)	NA
Hydrophyllaceae—Waterleaf family:						
Phacelia argillacea	Clay phacelia	U.S.A. (UT)	E	44	NA	NA
Phacelia formosula	North Park phacelia	U.S.A. (CO)	E	121	NA	NA
Lamiaceae—Mint family:						
Acanthomintha obovata ssp. duttonii	San Mateo thornmint	U.S.A. (CA)	E	204	NA	NA
Dicerandra cornutissima	Longspurred mint	U.S.A. (FL)	E	209	NA	NA
Dicerandra frutescens	Scrub mint	......do	E	209	NA	NA
Dicerandra immaculata	Lakela's mint	......do	E	180	NA	NA
Haplostachys haplostachya var. angustifolia	None	U.S.A. (HI)	E	73	NA	NA
Hedeoma apiculatum	McKittrick pennyroyal	U.S.A. (TX, NM)	T	118	17.96(a)	NA
Hedeoma todsenii	Todsen's pennyroyal	U.S.A. (NM)	E	110, 112	17.96(a)	NA
Pogogyne abramsii	San Diego mesa mint	U.S.A. (CA)	E	44	NA	NA
Stenogyne angustifolia var. angustifolia	None	U.S.A. (HI)	E	73	NA	NA
Liliaceae—Lily family:						
Harperocallis flava	Harper's beauty	U.S.A. (FL)	E	57	NA	NA
Trillium persistens	Persistent trillium	U.S.A. (GA, SC)	E	39	NA	NA
Loasaceae—Loasa family:						
Mentzelia leucophylla	Ash Meadows blazing star	U.S.A. (NV)	T	181	17.96(a)	NA
Malvaceae—Mallow family:						
Callirhoe scabriuscula	Texas poppy-mallow	U.S.A. (TX)	E	109, 112	NA	NA
Kokia cookei	Cooke's koki'o	U.S.A. (HI)	E	74	NA	NA
Kokia drynarioides	Koki'o (=hau-hele'ula or Hawaii tree cotton)	......do	E	167	17.96(a)	NA
Malacothamnus clementinus	San Clemente Island bush-mallow	U.S.A. (CA)	E	26	NA	NA
Sidalcea pedata	Pedate checker-mallow	......do	E	158	NA	NA
Nyctaginaceae—Four-o'clock family:						
Mirabilis macfarlanei	MacFarlane's four-o'clock	U.S.A. (ID, OR)	E	66	NA	NA
Onagraceae—Evening-primrose family:						
Camissonia benitensis	San Benito evening-primrose	U.S.A. (CA)	T	172	NA	NA
Oenothera avita ssp. eurekensis	Eureka Valley evening-primrose	......do	E	39	NA	NA
Oenothera deltoides ssp. howellii	Antioch Dunes evening-primrose	......do	E	39	17.96(a)	NA
Orchidaceae—Orchid family:						
Isotria medeoloides	Small whorled pogonia	U.S.A. (CT, IL, MA, MD, ME, MI, MO, NC, NH, NJ, NY, PA, RI, SC, VA, VT), Canada (Ont.)	E	122	NA	NA
Spiranthes parksii	Navasota ladies'-tresses	U.S.A. (TX)	E	116	NA	NA
Papaveraceae—Poppy family:						
Arctomecon humilis	Dwarf bear-poppy	U.S.A. (UT)	E	78	NA	NA

Species: Scientific name	Species: Common name	Historic range	Status	When listed	Critical habitat	Special rules
Pinaceae—Pine family:						
Abies guatemalensis	Guatemalan fir (= pinabete)	Mexico, Guatemala, Honduras, El Salvador.	T	84	NA	NA
Poaceae—Grass family:						
Tuctoria mucronata (= *Orcuttia m.*)	Solano grass	U.S.A. (CA)	E	44	NA	NA
Panicum carteri	Carter's panicgrass	U.S.A. (HI)	E	133	17.96(a)	NA
Swallenia alexandrae	Eureka Dune grass	U.S.A. (CA)	E	39	NA	NA
Zizania texana	Texas wild-rice	U.S.A. (TX)	E	39	17.96(a)	NA
Polygalaceae—Milkwort family:						
Polygala smallii	Tiny polygala	U.S.A. (FL)	E	182	NA	NA
Polygonaceae—Buckwheat family:						
Eriogonum gypsophilum	Gypsum wild buckwheat	U.S.A. (NM)	T	110, 112	17.96(a)	NA
Eriogonum pelinophilum	Clay-loving wild-buckwheat	U.S.A. (CO)	E	151	17.96(a)	NA
Primulaceae—Primrose family:						
Primula maguirei	Maguire primrose	U.S.A. (UT)	T	199	NA	NA
Ranunculaceae—Buttercup family:						
Aconitum noveboracense	Northern wild monkshood	U.S.A. (IA, NY, OH, WI)	T	39	NA	NA
Delphinium kinkiense	San Clemente Island larkspur	U.S.A. (CA)	E	26	NA	NA
Rhamnaceae—Buckhorn family:						
Gouania hillebrandii	None	U.S.A. (HI)	E	165	17.96(a)	NA
Rosaceae—Rose family:						
Cowania subintegra	Arizona cliffrose	U.S.A. (AZ)	E	148	NA	NA
Ivesia eremica	Ash Meadows ivesia	U.S.A. (NV)	T	181	17.96(a)	NA
Potentilla robbinsiana	Robbins' cinquefoil	U.S.A. (NH, VT)	E	104	17.96(a)	NA
Rubiaceae—Coffee family:						
Gardenia brighamii	Na'u (Hawaiian gardenia)	U.S.A. (HI)	E	188	NA	NA
Rutaceae—Citrus family:						
Zanthoxylum thomasianum	Prickly ash	U.S.A. (PR, VI)	E	213	NA	NA
Sarraceniaceae—Pitcher plant family:						
Sarracenia oreophila	Green pitcher plant	U.S.A. (AL, GA, TN)	E	56, 89	NA	NA
Saxifragaceae—Saxifrage family:						
Ribes echinellum	Miccosukee gooseberry	U.S.A. (FL, SC)	T	190	NA	NA
Scrophulariaceae—Snapdragon family:						
Castilleja grisea	San Clemente Island Indian paintbrush	U.S.A. (CA)	E	26	NA	NA
Cordylanthus maritimus ssp. *maritimus*	Salt marsh bird's-beak	U.S.A. (CA), Mexico (Baja California)	E	44	NA	NA
Pedicularis furbishiae	Furbish lousewort	U.S.A. (ME), Canada (New Brunswick).	E	39	NA	NA
Solanaceae—Nightshade family:						
Goetzea elegans	Beautiful goetzea, matabuey	U.S.A. (PR)	E	176	NA	NA
Styracaceae—Styrax family:						
Styrax texana	Texas snowbells	U.S.A. (TX)	E	162	NA	NA

Species		Historic range	Status	When listed	Critical habitat	Special rules
Scientific name	Common name					
Taxaceae—Yew family						
Torreya taxifolia	Florida torreya	U.S.A. (FL, GA)	E	140	NA	NA

E—Indicates Emergency rule publication (see FR document for effective dates); subsequent number(s) indicate FR final rule, if applicable under "when listed."

EDITORIAL NOTE: For "When listed" citations, see list following, for symbols in "When listed" see below:

38—42 FR 40686: August 11, 1977.
39—43 FR 17918: April 28, 1978.
44—43 FR 44812: September 28, 1978.
47—44 FR 24250: April 24, 1979.
49—44 FR 32806: June 6, 1979.
53—44 FR 43701: July 25, 1979.
56—44 FR 54823: September 21, 1979.
57—44 FR 58863: October 2, 1979.
58—44 FR 58868: October 11, 1979.
59—44 FR 58870: October 11, 1979.
61—44 FR 61556: October 25, 1979.
62—44 FR 61558: October 25, 1979.
63—44 FR 61786: October 26, 1979.
64—44 FR 61788: October 26, 1979
65—44 FR 61911: October 26, 1979.
66—44 FR 61913: October 26, 1979.
67—44 FR 61916: October 26, 1979.
68—44 FR 61920: October 26, 1979.
69—44 FR 61924: October 26, 1979.
70—44 FR 61927: October 26, 1979.
71—44 FR 61929: October 26, 1979.
72—44 FR 62246: October 26, 1979.
73—44 FR 62469: October 30, 1979.
74—44 FR 62471: October 30, 1979.
75—44 FR 62474: October 30, 1979.
76—44 FR 64247: November 6, 1979.
77—44 FR 64250: November 6, 1979.
78—44 FR 64252: November 6, 1979.
79—44 FR 64733: November 7, 1979.
80—44 FR 64738: November 7, 1979.
81—44 FR 64740: November 7, 1979.
82—44 FR 64743: November 7, 1979.
83—44 FR 64746: November 7, 1979.
84—44 FR 65006: November 8, 1979.
89—45 FR 18929: March 24, 1980.
104—45 FR 61944: September 17, 1980.
107—45 FR 69360: October 20, 1980.
109—46 FR 3184: January 13, 1981.
110—46 FR 5730: January 19, 1981.
112—46 FR 40025: August 6, 1981.
116—47 FR 19539: May 6, 1982.
118—47 FR 30440: July 13, 1982.
120—47 FR 36848: August 24, 1982.
121—47 FR 38540: September 1, 1982.
122—47 FR 38827: September 10, 1982.
126—47 FR 50886: November 10, 1982.
133—48 FR 46331: October 12, 1983.
137—48 FR 52747: November 22, 1983.
140—49 FR 2786: January 23, 1984.
141—49 FR 6102: February 17, 1984.
147—49 FR 21056: May 16, 1984.
148—49 FR 22329: May 29, 1984.
151—49 FR 28568: July 13, 1984.
152—49 FR 29234: July 19, 1984.
153—49 FR 29237: July 19, 1984.
154—49 FR 30201: July 27, 1984.
155—49 FR 31421: Aug. 7, 1984.
158—49 FR 34500: Aug. 31, 1984.
162—49 FR 40038: October 12, 1984.
165—49 FR 44756: November 9, 1984.
167—49 FR 47400: December 4, 1984.
168—49 FR 49639: December 21, 1984.
172—50 FR 5758: February 12, 1985.
175—50 FR 12309: March 28, 1985.
176—50 FR 15567: April 19, 1985.
177—50 FR 16682: April 28, 1985.
178—50 FR 19373: May 8, 1985.
179—50 FR 19377: May 8, 1985.
180—50 FR 20214: May 15, 1985.
181—50 FR 20786: May 20, 1985.
187—50 FR 26572: June 27, 1985.
190—50 FR 29341: July 18, 1985.
191—50 FR 29344: July 18, 1985.
192—50 FR 29349: July 18, 1985.
194—50 FR 31190: August 1, 1985.
197—50 FR 32573: August 13, 1985.
198—50 FR 33731: August 21, 1985.
199—50 FR 33734: August 21, 1985.
200—50 FR 33737: August 21, 1985.
201—50 FR 36088: September 5, 1985.
202—50 FR 36091: September 5, 1985.
204—50 FR 37863: September 18, 1985.
207—50 FR 45618: November 1, 1985.
208—50 FR 45621: November 1, 1985.
209—50 FR 45624: November 1, 1985.
213—50 FR 51870: December 20, 1985.
[48 FR 34182, July 27, 1983; 48 FR 34681, Aug. 2, 1983, as amended at 49 FR 33893, Aug. 27, 1984]

Editorial Note: For additional Federal Register citations affecting the table in § 17.12(h), see the listing which follows the table.

SPECIES REMOVED FROM THE ENDANGERED AND THREATENED LISTS

The following list of wildlife removed from the list at § 17.11 is provided for informational purposes only and is not codified in the Code of Federal Regulations. Only species completely removed from the list are included below. In cases where only a portion of the vertebrate species is delisted, the entry remains in § 17.11 in the modified form with the citation to the Federal Register indicted under "When listed."

The Service's listing regulations at 50 CFR 424.11(c) and (d) are as follows:

(c) A species shall be listed or reclassified if the Secretary determines, on the basis of the best scientific and commercial data available after conducting a review of the species' status, that the species is endangered or threatened because of any one or a combination of the following factors:

(1) The present or threatened destruction, modification, or curtailment of its habitat or range;

(2) Overutilization for commercial, recreational, scientific, or educational purposes;

(3) Disease or predation;

(4) The inadequacy of existing regulatory mechanisms; or

(5) Other natural or manmade factors affecting its continued existence.

(d) The factors considered in delisting a species are those in paragraph (c) of this section as they relate to the definitions of endangered or threatened species. Such removal must be supported by the best scientific and commercial data available to the Secretary after conducting a review of the status of the species. A species may be delisted only if such data substantiate that it is neither endangered nor threatened for one or more of the following reasons:

(1) *Extinction.* Unless all individuals of the listed species had been previously identified and located, and were later found to be extirpated from their previous range, a sufficient period of time must be allowed before delisting to indicate clearly that the species is extinct.

(2) *Recovery.* The principal goal of the U.S. Fish and Wildlife Service and the National Marine Fisheries Services is to return listed species to a point at which protection under the Act is no longer required. A species may be delisted on the basis of recovery only if the best scientific and commercial data available indicate that it is no longer endangered or threatened.

(3) *Original data for classification in error.* Subsequent investigations may show that the best scientific or commercial data available when the species was listed, or the interpretation of such data, were in error.

Species		Historic range	Former vertebrate population where endangered or threatened	Former status	Delisted	
Common name	Scientific name				Citation	Reason
Duck, Mexican	*Anas "diazi"*	U.S.A. (AZ, NM, TX) to central Mexico.	U.S. only	E	43 FR 32258–61; January 25, 1978.	Original data in error.
Pupfish, Tecopa	*Cyprinodon nevadensis calidae.*	U.S.A. (CA)	Entire	E	47 FR 2317–19; January 15, 1982.	Extinct.
Cisco, longjaw	*Coregonus alpenae*	U.S.A. and Canada (Lakes Michigan, Huron, Erie).	do	E	48 FR 39941–43; September 2, 1983.	Extinct.
Pike, blue	*Stizostedion vitreum glaucum*	U.S.A. and Canada (Lakes Erie, Ontario).	do	E	do	Extinct.
Sparrow, Santa Barbara song	*Melospiza melodia graminea*	U.S.A. (CA)	do	E	48 FR 46336–37; October 12, 1983.	Extinct.
Treefrog, Pine Barrens	*Hyla andersonii*	U.S.A. (FL, AL, NC, SC, NJ)	Florida	E	48 FR 52740–42; November 22, 1983.	Original data in error.
Pearly mussel, Sampson's	*Epioblasma (=Dysnomia) sampsoni*	U.S.A. (IL, IN)	NA	E	49 FR 1057–58; January 9, 1984.	Extinct.
Turtle, Indian flap-shelled	*Lissemys punctata punctata*	India, Pakistan, Bangladesh	Entire	E	49 FR 7394–98; February 29, 1984.	Original data in error.
Butterfly, Bahama swallowtail	*Heraclides (=Papilio) andraemon bonhotei*	U.S.A. (FL), Bahamas	NA	T	49 FR 34501–34504; August 31, 1984.	Original data in error.
Dove, Palau	*Gallicolumba canifrons*	W. Pacific: U.S.A. (Palau Islands).	Entire	E	50 FR 37192–37194; September 12, 1985.	Recovered.
Fantail, Palau (Old World flycatcher)	*Rhipidura lepida*	do	do	E	do	Recovered.
Owl, Palau	*Pyrroglaux (=Otus) podargina*	do	do	E	do	Recovered.

U.S. GOVERNMENT PRINTING OFFICE : 1986 O - 487-828

REFERENCE NO. 20

#S942, #01224 * JOHN, MGR NATREG, LOCPRNT * WED, FEB 4, 1987, 12 17 PM
#S942, #01224 * JOHN, MGR NATREG, LOCPRNT * WED, FEB 4, 1987, 12 17 PM
#S942, #01224 * JOHN, MGR NATREG, LOCPRNT * WED, FEB 4, 1987, 12 17 PM

NEW JERSEY
REGISTRY OF
NATIONAL HISTORIC
SITES + LANDMARKS
AS OF 2/4/87
FROM U.S. Dept. of The
Interior

#S942; #01224 * JOHN, MGR NATREG, LOCPRNT * WED, FEB 4, 1987, 12
#S942; #01224 * JOHN, MGR NATREG; LOCPRNT * WED, FEB 4, 1987,
#S942; #01224 * JOHN, MGR NATREG, LOCPRNT * WED, FEB 4, 1987, 12

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#S942, #01224 * JOHN, MGR NATREG, LOCPRNT * WED,

#S942, #01224 * JOHN, MGR NATREG
#S942; #01224 * JOHN, MGR NATREG
#S942, #01224 * JOHN, MGR NAT :G

Fishing Creek Schoolhouse — Listed
2102 Bayshore Rd. — 03/06/80
Reference No. 80002478

Woodbine

Woodbine Brotherhood Synagogue — Listed
612 Washington Ave — 09/17/80
Reference No. 80002479

Cumberland County

Bridgeton

Bridgeton Historic District — Listed
Roughly bounded by RR Tracks, South Ave., Lake, Commerce, Water, Belmont, Cohensey, and Penn Sts — 10/29/82
Reference No. 82001043

Buck, Jeremiah, House — Listed
(Elmer,Jonathan,House) — 12/30/75
297 E. Commerce St.
Reference No. 75001130

Deerfield Pike Tollgate House — Listed
89 Old Deerfield Pike — 05/21/75
Reference No. 75001131

Giles, Gen. James, House — Listed
(Gates House) — 03/08/78
143 W. Broad St.
Reference No. 78001754

Old Broad Street Presbyterian Church and Cemetery — Listed
(First Presbyterian Church) — 12/02/74
Broad and Lawrence Sts.
Reference No. 74001159

Potter's Tavern — Listed
49--51 Broad St — 09/10/71
Reference No. 71000501

Seeley, Samuel W., House — Listed
(McGee,Robert,House) — 05/13/76
274 E. Commerce St.
Reference No. 76001150

SPINDRIFT SAILING YACHT — Listed
S. of Bridgeton — 04/22/82
Reference No. 82003271

Carmel

Beth Hillel Synagogue — Listed
Irving Ave. — 11/07/78
Reference No. 78001755

Cedarville Vicinity

Old Stone Church — Listed
N of Cedarville on NJ 553 — 05/12/77
Reference No. 77000860

Greenwich

Greenwich Historic District — Listed
Main St. from Cohansey River N to Othello — 01/20/72
Reference No. 72000772

Maskel, Thomas, House — Listed
2 mi. W of Greenwich on Bacon's Neck Rd — 06/10/75
Reference No. 75001132

Millville

Millville's First Bank Building — Listed
(Old Library Building) — 11/20/80
2nd and E. Main Sts
Reference No. 80002480

Seabrook Vicinity

Deerfield Presbyterian Church — Listed
NE of Seabrook — 09/29/80
Reference No. 80002481

Essex County

Belleville

Reformed Dutch Church of Second River — Listed
(Belleville Dutch Reformed Church) — 12/21/78
171 Main St

REFERENCE NO. 21

NUS CORPORATION TELECON NOTE

CONTROL NO: 02-8805-04	DATE: 8/19/88	TIME: 1530

DISTRIBUTION:

Aircraft Painting, Inc.

BETWEEN: Jack Harris	OF: Millville Water Dept.	PHONE: (609) 825-7000

AND: Joann Wagner (NUS)

DISCUSSION:

I called Mr. Harris for information concerning the Millville Municipal wells. He told me that these wells are all interconnected, and serve approximately 23,000 people. The service area is limited to the City of Millville. Anybody outside of the service area uses private wells (Mr. Harris included). He said his well is only 65 feet deep, and he thinks that most other private wells are shallow also. Therefore, it is possible that those private wells are not in the Kirkwood and/or Cohansey. He asked if I had found a problem with the water (re our site inspection on 8/3/88) & I told him we had not yet received the analytical results.

ACTION ITEMS:

NUS 087 REVISED 0581

1

02-8805-04

NUS CORPORATION — TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-8805-04	7/22/88	1400

DISTRIBUTION:

Aircraft Painting, Inc.

BETWEEN:	OF:	PHONE:
Jack Harris	Millville Water Dept.	(609) 825-7000

AND: Joann Wagner (NUS)

DISCUSSION:

1400 - Jack Harris on another line; left message for him to return my call.

1405 Jack Harris returned my call. I asked him if we could sample the wells on the airport in conjunction with the site inspection we will be doing on Aug. 2. He said yes, but that he wants it stated in writing that he will receive a copy of the analytical results. I told him that his request would have to be directed to the EPA and that it may take as long as 6 months to get the results.

He told me that the wells are used for public supply and are currently in use. There are sampling locations that are accessible prior to treatment. All wells are located in well houses. I should call again on July 29 to make arrangements to have one of the operators accompany

ACTION ITEMS:

us to the wells (Jack Harris will not be there during the week of Aug. 1).

The direction of groundwater flow is west to east.

Well locations were identified as follows:

- Bogden Blvd - 50 to 75 feet past treatment building on Bogden Blvd on left (east) side of the road
- Peterson Road - (right turn off Bogden) - approximately

NUS CORPORATION — *TELECON NOTE*

CONTROL NO:	DATE:	TIME:
02-8805-04	7/22/88	1400

DISTRIBUTION:

Aircraft Painting, Inc.

BETWEEN:	OF:	PHONE:
Jack Harris	Millville Water Dept.	(609) 825-7000

AND: Joann Wagner (NUS)

DISCUSSION:

450 to 500 feet on left side of Peterson

o Follow Peterson Road to end and turn left; proceed approx. 200 feet. Well is located ~ 50 feet off this road to the right.

An operator will have ~~to~~ take us to each location, as the well houses are locked.

Joann Wagner
7/22/88

ACTION ITEMS:

REFERENCE NO. 22

NUS CORPORATION **TELECON NOTE**

CONTROL NO:	DATE:	TIME:
02-8910-03-S1	10/5/89	11:49

DISTRIBUTION: Aircraft Painting Inc

BETWEEN:	OF:	PHONE:
Mary Kuserk	NJDEP Discharge Permits	(609)292-0424

AND: Gerald Hannay (NUS)

DISCUSSION: Aircraft Painting does not have a NJPDES Permit.

ACTION ITEMS:

REFERENCE NO. 23

SITE NAME: AIRCRAFT PAINTING, INC.
TDD#: 02-8805-04
SAMPLING DATE: 08/02/88
EPA CASE NO.: 10155 LAB: RECRA ENVIRONMENTAL, INC.

VOLATILES												
Sample ID No.	NJ88-SW-1(MS/MSD)	NJ88-SED-1(MS/MSD)	NJ88-SW-2	NJ88-SED-2	NJ88-SW-3(DUP)	NJ88-SED-3(DUP)	NJ88-GW-1	NJ88-GW-2	NJ88-TA-1	NJ88-RIN-1	NJ88-RIN-2	NJ88-TRK-1
Traffic Report No.	BT415	BT412	BT416	BT413	BT417	BT414	BT418	BT419	BT411	BT421	BT422	BT423
Matrix	WATER	SEDIMENT	WATER	SEDIMENT	WATER	SEDIMENT	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/kg	ug/L	ug/kg	ug/L	ug/kg	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor	1.00	10.0	1.00	10.0	1.00	10.0	1.00	1.00	1.00	1.00	1.00	1.00
Percent Moisture	--	24	--	22	--	22	--	--	--	--	--	--
Chloromethane												
Bromomethane												
Vinyl Chloride												
Chloroethane												
Methylene Chloride										R	B	B
Acetone										J	J	J
Carbon Disulfide										B	B	B
1,1-Dichloroethene												
1,1-Dichloroethane												
Trans-1,2-Dichloroethene (total)	J							J				
Chloroform										J	J	J
1,2-Dichloroethane												
2-Butanone	R	R	R	R	R	R	R	R	R	R	R	R
1,1,1-Trichloroethane												
Carbon Tetrachloride												
Vinyl Acetate												
Bromodichloromethane												J
1,2-Dichloropropane												
cis-1,3-Dichloropropene												
Trichloroethene								J				
Dibromochloromethane												
1,1,2-Trichloroethane												
Benzene										J	J	J
trans-1,3-Dichloropropene												
Bromoform												
4-Methyl-2-Pentanone												
2-Hexanone												
Tetrachloroethene	J		J		J			15	J			
Toluene										B	B	B
1,1,2,2-Tetrachloroethane												
Chlorobenzene											J	
Ethylbenzene												
Styrene												
Xylenes (Total)												

NOTES:
Blank space - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of a compound, but can't be identified
NR - analysis not required

SITE NAME: AIRCRAFT PAINTING, INC.
TDD#: 02-8805-04
SAMPLING DATE: 08/02/88
EPA CASE NO.: 10155 LAB: RECRA ENVIRONMENTAL, INC.

SEMI-VOLATILES												
Sample ID No.	NJ88-SW-1(MS/MSD)	NJ88-SED-1(MS/MSD)	NJ88-SW-2	NJ88-SED-2	NJ88-SW-3(DUP)	NJ88-SED-3(DUP)	NJ88-GW-1	NJ88-GW-2	NJ88-TA-1	NJ88-RIN-1	NJ88-RIN-2	NJ88-TBLK-1
Traffic Report No.	BT415	BT412	BT416	BT413	BT417	BT414	BT418	BT419	BT411	BT421	BT422	BT423
Matrix	WATER	SEDIMENT	WATER	SEDIMENT	WATER	SEDIMENT	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/kg	ug/L	ug/kg	ug/L	ug/kg	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1.00	10.0/Y	1.00	10.0/Y	1.00	10.0/Y	1.00	1.00	20.0	1.00	1.00	N/A
Percent Moisture	--	24	--	22	--	22	--	--	--	--	--	N/A
Phenol				J		10000 E			3700 E			NR
bis(2-Chloroethyl)ether												NR
2-Chlorophenol												NR
1,3-Dichlorobenzene												NR
1,4-Dichlorobenzene												NR
Benzyl alcohol									770 E			NR
1,2-Dichlorobenzene												NR
2-Methylphenol									320 E			NR
bis(2-Chloroisopropyl)ether												NR
4-Methylphenol									340 E			NR
N-Nitroso-di-n-dipropylamine												NR
Hexachloroethane												NR
Nitrobenzene												NR
Isophorone												NR
2-Nitrophenol												NR
2,4-Dimethylphenol												NR
Benzoic acid												NR
bis(2-Chloroethoxy)methane												NR
2,4-Dichlorophenol												NR
1,2,4-Trichlorobenzene												NR
Naphthalene		J										NR
4-Chloroaniline												NR
Hexachlorobutadiene												NR
4-Chloro-3-Methylphenol												NR
2-Methylnaphthalene		J				J			J			NR
Hexachlorocyclopentadiene												NR
2,4,6-Trichlorophenol												NR
2,4,5-Trichlorophenol												NR
2-Chloronaphthalene												NR
2-Nitroaniline												NR
Dimethylphthalate												NR
Acenaphthylene												NR
2,6-Dinitrotoluene												NR
3-Nitroaniline												NR
Acenaphthene												NR
2,4-Dinitrophenol												NR
4-Nitrophenol												NR
Dibenzofuran												NR
2,4-Dinitrotoluene												NR
Diethylphthalate												NR
4-Chlorophenyl-phenyl ether												NR
Fluorene												NR
4-Nitroaniline												NR
4,6-Dinitro-2-methylphenol												NR
N-nitrosodiphenylamine										B		NR
4-Bromophenyl-phenyl ether												NR
Hexachlorobenzene					J							NR

SITE NAME: AIRCRAFT PAINTING, INC.
TDD#: 02-8805-04
SAMPLING DATE: 08/02/88
EPA CASE NO.: 10155 LAB: RECRA ENVIRONMENTAL, INC.

SEMI-VOLATILES												
Sample ID No.	NJ88-SW-1(MS/MSD)	NJ88-SED-1(MS/MSD)	NJ88-SW-2	NJ88-SED-2	NJ88-SW-3(DUP)	NJ88-SED-3(DUP)	NJ88-GW-1	NJ88-GW-2	NJ88-TA-1	NJ88-RIN-1	NJ88-RIN-2	NJ88-TBK-1
Traffic Report No.	BT415	BT412	BT416	BT413	BT417	BT414	BT418	BT419	BT411	BT421	BT422	BT423
Matrix	WATER	SEDIMENT	WATER	SEDIMENT	WATER	SEDIMENT	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/kg	ug/L	ug/kg	ug/L	ug/kg	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1.00	10.0/Y	1.00	10.0/Y	1.00	10.0/Y	1.00	1.00	20.0	1.00	1.00	N/A
Percent Moisture	--	24	--	22	--	22	--	--	--	--	--	N/A
Pentachlorophenol		R										NR
Phenanthrene		J		J		J						NR
Anthracene				J								NR
Di-n-butylphthalate									J			NR
Fluoranthene		J		J		J						NR
Pyrene		J		J		J						NR
Butylbenzylphthalate		J		J		J			7100 E			NR
3,3'-Dichlorobenzidine												NR
Benzo(a)anthracene		J		J		J						NR
Chrysene		J		J		J						NR
bis(2-Ethylhexyl)phthalate	J	J		17000 E		J			1100 E			NR
Di-n-octylphthalate									J			NR
Benzo(b)fluoranthene				J								NR
Benzo(k)fluoranthene												NR
Benzo(a)pyrene				J								NR
Indeno(1,2,3-cd)pyrene				J								NR
Dibenz(a,h)anthracene												NR
Benzo(g,h,i)perylene				J								NR

NOTES:
Blank space - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of a compound, but can't be identified
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >0%

SITE NAME: AIRCRAFT PAINTING, INC.
TDD#: 02-8805-04
SAMPLING DATE: 08/02/88
EPA CASE NO.: 10155 LAB: RECRA ENVIRONMENTAL, INC.

PESTICIDES												
Sample ID No.	NJ88-SW-1(MS/MSD)	NJ88-SED-1(MS/MSD)	NJ88-SW-2	NJ88-SED-2	NJ88-SW-3(DUP)	NJ88-SED-3(DUP)	NJ88-GW-1	NJ88-GW-2	NJ88-TA-1	NJ88-RIN-1	NJ88-RIN-2	NJ88-TBLK-1
Traffic Report No.	BT415	BT412	BT416	BT413	BT417	BT414	BT418	BT419	BT411	BT421	BT422	BT423
Matrix	WATER	SEDIMENT	WATER	SEDIMENT	WATER	SEDIMENT	WATER	WATER	WATER	WATER	WATER	WATER
Units	ug/L	ug/kg	ug/L	ug/kg	ug/L	ug/kg	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Dilution Factor/GPC Cleanup (Y)	1.00	1.00/Y	1.00	1.00/Y	1.00	1.00/Y	1.00	1.00	1.00	1.00	1.00	N/A
Percent Moisture	--	24	--	22	--	22	--	--	--	--	--	N/A
alpha-BHC												NR
beta-BHC												NR
delta-BHC		22							J			NR
gamma-BHC (Lindane)												NR
Heptachlor												NR
Aldrin												NR
Heptachlor epoxide												NR
Endosulfan I						J						NR
Dieldrin												NR
4,4'-DDE												NR
Endrin												NR
Endosulfan II												NR
4,4'-DDD						170						NR
Endosulfan sulfate												NR
4,4'-DDT				410								NR
Methoxychlor												NR
Endrin ketone												NR
alpha-Chlordane												NR
gamma-Chlordane				J		26						NR
Toxaphene												NR
Aroclor-1016												NR
Aroclor-1221												NR
Aroclor-1232												NR
Aroclor-1242												NR
Aroclor-1248												NR
Aroclor-1254												NR
Aroclor-1260												NR

NOTES:
Blank space - compound analyzed for but not detected
B - compound found in lab blank as well as sample, indicates possible/probable blank contamination
E - estimated value
J - estimated value, compound present below CRQL but above IDL
R - analysis did not pass EPA QA/QC
N - Presumptive evidence of the presence of a compound, but can't be identified
NR - analysis not required
Detection limits elevated if Dilution Factor >1 and/or percent moisture >10%

organic

Title: Attachment 2 - CLP Data Assessment Checklist
(GC and GC/MS Analysis)
PART II: MMB Review - TOTAL REVIEW

CASE # 10155 LAB Recra SITE Aircraft Painting

19.0 Conclusions: (NOTE: Reviewers must red-line unacceptable data on sample data (FORM I) sheets; red-line data does not imply the compound is not present). Only the MMB reviewer has the authority to red-line unacceptable data. The letter J indicates an estimated value. In addition to the two definitions stated in the contract it also implies that the analyte is present but the quantitative value contains an unspecified degree of error. If an accurate quantity is desired, resampling/analysis is recommended.

19.1 Data Assessment 1) Blanks are analysed along with environmental samples to determine contamination not indigenous to the samples. Method blanks determine contamination introduced in the laboratory by "impure" solvents, "dirty" glassware, etc. In the volatile fraction the method blanks contained methylene chloride, carbon disulfide, toluene, benzene, ~~chlorobenzene~~ PC, chloroform, 1,1,2,2-tetrachloroethane and TIC's. Trip/rinsate blanks determine contamination introduced in sampling, decontamination, the lab's preparation of the samples etc. The trip and rinse blanks contained the contaminants in the method blanks and chlorobenzene, acetone & bromodichloromethane. The samples were qualified (u) non-detect [(R) reject TICs] for

19.2 Contract Problems/Non-compliance BNA soils all diluted 10X for no apparent reason.

Reviewer's Signature: Pamela Greenlaw Date: 12/16/88

Verified By: Date:

...A ASSESSMENT: (cont.) #10155 12/16/88 Pamela Greenlaw

...e associated analytes:

..11 methylene chloride
acetone
chloroform
benzene
toluene

BT 412 benzene
toluene
chlorobenzene

BT414 methylene chloride

...4.5 methylene chloride
chloroform
benzene
acetone
toluene
chlorobenzene

BT416 & BT419 methylene chloride
acetone
carbon disulfide
chloroform
benzene
toluene
chlorobenzene

BT 417 methylene chloride
acetone
carbon disulfide
chloroform
benzene
toluene
~~chlorobenzene~~ PG

BT418 methylene chloride
carbon disulfide
chloroform
benzene
toluene

~~methylene chloride~~ PG The semivolatile blanks contained n-nitrosodiphenylamine ...TICs. The samples were flagged (u) non-detect BT411-414, 416-419.
...librations are required to ensure that the instruments are capable of ...ucing acceptable quantitative data. In the volatile fraction the RRF < 0.05 ...2-butanone; all samples flagged (R) reject. The %D/% RSD was greater than 30% for several analytes. The samples were flagged (J) estimated as follows ~~...-414: bis~~ PG BT 415, 416, 419, 421-423: chloromethane; chloroethane; carbon ...di; dibromochloromethane; 1,1,2-trichloroethane & bromo~~methane~~form. BT417, 418: ...romethane; chloroethane; acetone; carbon disulfide and total xylenes. BT411: acetone, carbon disulfide, chloromethane and chloroethane
In the BNA fraction the %D/% RSD was greater than 25/30% for several ...l...tes in the various calibrations. The samples were flagged (J) estimated ...follows: BT 412-414: bis (2-chloroethyl) ether; benzoic acid; hexachlorocyclo-...tadiene; 3-nitroaniline; 2,4-dinitrophenol; 4-nitroaniline; 4,6-dinitro-2-methylphenol;

DATA ASSESSMENT: (cont.) # 10155 12/16/88 P Greenlaw

~~and~~ 3,3' dichlorobenzidine and bis (2-ethylhexyl) phthalate. BT 415: hexachloroethane; benzoic acid; 3-nitroaniline; 2,4-dinitrophenol; 4-nitrophenol; 4-nitroaniline; butylbenzyl-phthalate and 3,3'-dichlorobenzidine. BT 416, 418, 421: bis(2-chloroethyl) ether; hexachloroethane; 3-nitroaniline; 2,4-dinitrophenol; 4-nitrophenol; 4-nitroaniline; butylbenzylphthalate; 3,3'dichlorobenzidine & bis(2-ethylhexyl) phthalate. BT 417 & 422: hexachlorocyclopentadiene; 3-nitroaniline; 2,4-dinitrophenol; 4-nitroaniline; butylbenzylphthalate and 3,3'dichlorobenzidine. BT 419: bis(2chloroethyl) ether; benzyl alcohol; N-nitroso-Di-n-propylamine; hexachloroethane; 4-chloroaniline; 3-nitroaniline; 2,4-dinitrophenol; 4-nitroaniline and 3,3'-dichlorobenzidine.

3) Laboratory performance on individual samples is established by means of spiking all samples with surrogate compounds prior to sample preparation. In the volatile fraction one or more surrogate recoveries were above contract required limits for samples BT 412, 413 & 414. The samples were flagged (J) estimated. In the semivolatile fraction the surrogate compounds were outside specifications for sample BT 411 - all analytes flagged (J) estimated.

4) Matrix spike/matrix spike duplicate analyses are generated to determine long-term precision and accuracy of the method on various matrices. In the MS/MSD analyses in the BNA fraction for sample BT 412 no recovery was reported for pentachlorophenol. The sample was flagged (R) reject for that analyte. BT 412

5) In the semivolatile fraction the soil samples were flagged (J) estimated due to the analyses being incorrectly run at a 10X dilution by the laboratory. The analytes may be present at concentrations below the detection limits. Also the dilution factors were changed to 10 due to the lab's incorrect response to CCS screening - CRQLs were doubled due to GPC which is not to be included in the dilution factor.

RECRA ENVIRONMENTAL, INC.

Chemical Waste Analysis, Prevention and Control

FIT/SI

10155

AIRCRAFT PAINTING

9 W

3 > MCC

September 12, 1988

RECEIVED

SEP 13 1988

Ms. Diane Cutler
U.S. EPA Contract Lab Program
Sample Management Office (SMO)
300 North Lee Street
Suite 200
Alexandria, VA 22314

Re: Analytical Results

Dear Ms. Cutler:

Please find enclosed results concerning the analyses of the samples recently submitted by your agency.

Pertinent Information: Quote #: 0047
Matrix: Aqueous and Soil
Samples Received: 8/4/88
Sample Date: 8/2/88

If you have any questions concerning these data, do not hesitate to contact our Customer Service Representative at (716) 691-2600.

Sincerely,

RECRA ENVIRONMENTAL, INC.

AK Bhattacharya/djt

Arun K. Bhattacharya, Ph.D.
Senior Vice President/
Laboratory Director

MLD/AKB/ndc
Enclosure
cc: EMSL-LV
U.S. EPA Region II

I.D. #88-1228
#88-1228A
#8A1242

Audubon Business Centre • 10 Hazelwood Drive, Suite No. 106 • Amherst, New York 14150 • (716) 691-2600

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116

CASE NARRATIVE

Laboratory Name: Recra Environmental, Inc.
Laboratory Code: RECNY
Case Number: 10155
SDG Number: BT411
Contract Number: 68-W8-0047

RECEIVED
SEP 13 1988

Sample Identifications:

BT411	BT411 MS	BT411 MSD
BT412	BT412 MS	BT412 MSD
BT413		
BT414		
BT415	BT415 MS	BT415 MSD
BT416		
BT417		
BT418		
BT419		
BT421		
BT422		
BT423		

Samples were received at Recra Environmental, Inc. on August 4, 1988 via Federal Express (Airbill numbers 9276042613 and 6004136460). Samples were delivered to Recra's office facility at 10 Hazelwood Drive, Amherst, New York and were transferred by Recra personnel to the organic laboratory at 111 Wales Avenue, Tonawanda, New York. All chain of custody seals were intact.

VOLATILE DATA

Volatile sample and standard areas are listed on the corresponding data system printouts.

Volatile data was processed utilizing Finnigan Autoquantitation and QA Formaster software. Compounds not listed on the quantitation report were deleted if contract laboratory protocol criteria were not met.

Soil samples were analyzed by the medium level method. Samples exhibited elevated surrogate recoveries due to matrix interferences. Soil samples were also diluted by a factor of ten (10) prior to analysis.

Vinyl Chloride on the continuing calibration FRN 27162HP showed a % D of 29.0%. No vinyl chloride was detected in the associated samples.

Aqueous sample BT415 MSD exhibited one (1) surrogate recovery outside of acceptable QC limits.

Aqueous samples BT411, BT411 MS and BT411 MSD were diluted by a factor of 500 prior to analysis.

RECRA ENVIRONMENTAL, INC.

Due to a software error, dilution factors on Form 1 are incorrect for some samples. Sample weights or volumes and values reported for TCL and non-TCL compounds are, however, correct. This applies to the following samples:

BT411
BT411 MS
BT411 MSD
BT412
BT412 MS
BT412 MSD
BT413
BT414

SEMIVOLATILE DATA

Semivolatile sample and standard areas are listed on the corresponding data system printouts.

Semivolatile data was processed utilizing Finnigan Autoquantitation and QA Formaster software. Compounds not listed on the quantitation report were deleted if contract laboratory protocol criteria were not met.

Severe sample matrix interferences were encountered during analysis of the samples, causing many surrogate and spike recoveries to be outside of acceptable QC limits.

Water sample BT411 and its matrix spike, matrix spike duplicate were diluted by factors of twenty (20) and two hundred (200) prior to analysis. All data for both primary and secondary dilutions have been included.

Soil samples were diluted to ten (10) prior to analysis due to sample matrix.

A search for tentatively identified compounds was not performed on sample BT411 DL, but was performed on the more concentrated extract of BT411.

Due to a software error, dilution factors on Form I are not expressed on a decimal basis. Values for TCL and non-TCL compounds as well as sample weights or volumes are, however, correct. This applies to the following samples:

BT411
BT411 DL
BT411 MS
BT411 MS DL
BT411 MSD
BT411 MSD DL
BT412
BT412 MS
BT412 MSD
BT413
BT414

PESTICIDE/PCB DATA

Compounds confirmed by two dissimilar GC columns were not confirmed by GC/MS due to insufficient concentration in the sample extracts.

Surrogate recoveries could not be determined for samples BT411, BT411 MS, and BT411 MSD due to the dilution of the extracts required. Sample BT418 exhibited elevated surrogate recovery attributed to matrix interference.

The matrix spike, matrix spike duplicate recoveries for BT411 could not be calculated due to dilution of the samples.

The matrix spike, matrix spike duplicate of BT415 exhibited five (5) RPD values and two (2) spike recoveries outside of acceptable QC limits.

Values reported for spike compounds for the matrix spike, matrix spike duplicate of BT412 represent coeluting peaks that were not positively identified as per retention time criteria. The asterisked values on Form 3F were employed for calculation purposes only and were not reported on the Form I for sample BT412.

Values greater than 2% for the retention time shift of dibutyl chlorendate for the quantitation column are attributed to matrix interference.

"DL" has been reported for %D on Form 8E when Dibutyl Chlorendate was diluted out of the sample extract.

"Release of the data contained in this hardcopy data package and in the computer-readable data submitted on floppy diskette has been authorized by the Laboratory Manager or his designee, as verified by the following signature."

A K Bhattacharya / djt

Dr. Arun K. Bhattacharya

9/12/88

Date

RECRA ENVIRONMENTAL, INC.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 297

BT415

h Name: RECRA ENVIRON Contract: 68-W8-0047

b Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

rix: (soil/water) WATER Lab Sample ID: BT415

mple wt/vol: 5.0 (g/mL) ML Lab File ID: 6498

el: (low/med) LOW Date Received: 08/04/88

Moisture: not dec. ____ Date Analyzed: 08/05/88

lumn: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	UJ
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	UJ
75-09-2	Methylene Chloride	7	~~B~~ U
67-64-1	Acetone	10 ~~4~~	~~J~~ U
75-15-0	Carbon Disulfide	63	~~BJ~~ U
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	0.4	J
67-66-3	Chloroform	5 ~~0.5~~	~~J~~ U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	UR
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	Trans-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	UJ
79-00-5	1,1,2-Trichloroethane	5	UJ
71-43-2	Benzene	5 ~~0.2~~	~~J~~ U
10061-02-6	cis-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	UJ
591-78-6	2-Hexanone	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
127-18-4	Tetrachloroethene	1	J
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5 ~~0.5~~	~~BJ~~ U
108-90-7	Chlorobenzene	5 ~~0.4~~	~~J~~ U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BT415

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT415

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6498

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - Date Analyzed: 8/5/88

Column: (pack/cap) PACK Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	2:34	11	B
2. -	UNKNOWN	5:52	24	B
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

FORM I VOA-TIC

1E

VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BT414 268

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT414

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 27169HP

Level: (low/med) MED Date Received: 8/4/88

% Moisture: not dec. 22 Date Analyzed: 8/12/88

Column: (pack/cap) PACK Dilution Factor: 10.0

Number TICs found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	2:34	490,000	BK
2. -	UNKNOWN	6:59	410,000	BK
3. -	SUBSTITUTED SILOXANE COMPOUND	17:37	21,000	
4. -	SUBSTITUTED ALKYL HYDROCARBON	27:55	61,000	
5. -	SUBSTITUTED ALKYL HYDROCARBON	31:15	29,000	
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				
17.				
18.				
19.				
20.				
21.				
22.				
23.				
24.				
25.				
26.				
27.				
28.				
29.				
30.				

FORM I VOA-TIC

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 415

BT418

ab Name: RECRA ENVIRON Contract: 68-W8-0047

ab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

atrix: (soil/water) WATER Lab Sample ID: BT418

ample wt/vol: 5.0 (g/mL) ML Lab File ID: 6528

evel: (low/med) LOW Date Received: 08/04/88

Moisture: not dec. ____ Date Analyzed: 08/10/88

olumn: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	UJ
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	UJ
75-09-2	Methylene Chloride	5	~~B~~ U
67-64-1	Acetone	73	J
75-15-0	Carbon Disulfide	5 ~~2~~	~~BJ~~ UJ
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5 ~~0.5~~	~~BJ~~ U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	UR
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	Trans-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5 ~~0.08~~	~~BJ~~ U
10061-02-6	cis-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
591-78-6	2-Hexanone	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5 ~~0.2~~	~~BJ~~ U
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	UJ

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO. 418
BT418

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT418

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6528

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - Date Analyzed: 8/10/88

Column: (pack/cap) PACK Dilution Factor: 1.00

Number TICs found: 3

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	2:30	14	BK
2. -	UNKNOWN	4:18	6	BK
3. -	UNKNOWN	5:22	28	BK
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FORM I VOA-TIC

453

EPA SAMPLE NO.

BT419

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

ab Name: RECRA ENVIRON   Contract: 68-W8-0047

ab Code: RECNY   Case No.: 10155   SAS No.: ______   SDG No.: BT411

atrix: (soil/water) WATER   Lab Sample ID: BT419

ample wt/vol: 5.0 (g/mL) ML   Lab File ID: 6500

el: (low/med) LOW   Date Received: 08/04/88

Moisture: not dec. ____   Date Analyzed: 08/05/88

olumn: (pack/cap) PACK   Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	UJ
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	UJ
75-09-2	Methylene Chloride	5 ~~4~~	~~BJ~~ U
67-64-1	Acetone	7	~~J~~ U
75-15-0	Carbon Disulfide	6	~~B~~ UJ
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	0.2	J
67-66-3	Chloroform	5 ~~0.7~~	~~J~~ U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	UR
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	Trans-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	0.8	J
124-48-1	Dibromochloromethane	5	UJ
79-00-5	1,1,2-Trichloroethane	5	UJ
71-43-2	Benzene	5 ~~0.3~~	~~J~~ U
10061-02-6	cis-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	UJ
591-78-6	2-Hexanone	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
127-18-4	Tetrachloroethene	15	
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5 ~~0.4~~	~~BJ~~ U
108-90-7	Chlorobenzene	5 ~~0.2~~	~~J~~ U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BT419 454

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT419

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6500

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - Date Analyzed: 8/5/88

Column: (pack/cap) PACK Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	2:38	13	B
2. -	UNKNOWN	6:00	33	B
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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

148

BT411

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT411

Sample wt/vol: 0.010 (g/mL) ML Lab File ID: 6517

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ Date Analyzed: 08/08/88

Column: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	5000	UJ
74-83-9	Bromomethane	5000	U
75-01-4	Vinyl Chloride	5000	U
75-00-3	Chloroethane	5000	UJ
75-09-2	Methylene Chloride	51000	U
67-64-1	Acetone	5000 ~~460~~	~~J~~ UJ
75-15-0	Carbon Disulfide	2500 ~~620~~	~~J~~ UJ
75-35-4	1,1-Dichloroethene	2500	U
75-34-3	1,1-Dichloroethane	2500	U
540-59-0	1,2-Dichloroethene (total)	2500	U
67-66-3	Chloroform	2500 ~~40~~	~~J~~ U
107-06-2	1,2-Dichloroethane	2500	U
78-93-3	2-Butanone	5000	UR
71-55-6	1,1,1-Trichloroethane	2500	U
56-23-5	Carbon Tetrachloride	2500	U
108-05-4	Vinyl Acetate	5000	U
75-27-4	Bromodichloromethane	2500	U
78-87-5	1,2-Dichloropropane	2500	U
10061-01-5	Trans-1,3-Dichloropropene	2500	U
79-01-6	Trichloroethene	2500	U
124-48-1	Dibromochloromethane	2500	U
79-00-5	1,1,2-Trichloroethane	2500	U
71-43-2	Benzene	2500 ~~62~~	~~J~~ U
10061-02-6	cis-1,3-Dichloropropene	2500	U
75-25-2	Bromoform	2500	U
591-78-6	2-Hexanone	5000	U
108-10-1	4-Methyl-2-Pentanone	5000	U
127-18-4	Tetrachloroethene	66	J
79-34-5	1,1,2,2-Tetrachloroethane	2500	U
108-88-3	Toluene	2500 ~~1600~~	~~B~~ U
108-90-7	Chlorobenzene	2500	U
100-41-4	Ethylbenzene	2500	U
100-42-5	Styrene	2500	U
1330-20-7	Total Xylenes	2500	U

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1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BT411
1-9

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT411

Sample wt/vol: .010 (g/mL) ML Lab File ID: 6517

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - Date Analyzed: 8/8/88

Column: (pack/cap) PACK Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	2:26	3,400	B
2. -	UNKNOWN	5:28	10,000	B
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FORM I VOA-TIC

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 498

BT421

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT421

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6501

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ Date Analyzed: 08/05/88

Column: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	UJ
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	UJ
75-09-2	Methylene Chloride	4	BJ
67-64-1	Acetone	3	J
75-15-0	Carbon Disulfide	2	BJ
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	2	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	UR
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	Trans-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	UJ
79-00-5	1,1,2-Trichloroethane	5	UJ
71-43-2	Benzene	0.2	J
10061-02-6	cis-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	UJ
591-78-6	2-Hexanone	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	0.3	BJ
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BT421

499

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT421

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6501

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - Date Analyzed: 8/5/88

Column: (pack/cap) PACK Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	2:38	13	B
2. -	UNKNOWN	6:02	26	B
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FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT422

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT422

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6503

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ Date Analyzed: 08/05/88

Column: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	UJ
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	UJ
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	1	J
75-15-0	Carbon Disulfide	11	BJ
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	2	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	UR
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	Trans-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	UJ
79-00-5	1,1,2-Trichloroethane	5	UJ
71-43-2	Benzene	0.3	J
10061-02-6	cis-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	UJ
591-78-6	2-Hexanone	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	0.5	BJ
108-90-7	Chlorobenzene	0.2	J
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

532

1E
VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BT422

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT422

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6503

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - Date Analyzed: 8/5/88

Column: (pack/cap) PACK Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	2:38	11	B
2. -	UNKNOWN	5:52	30	B
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FORM I VOA-TIC

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
567

BT423

Lab Name: RECRA ENVIRON   Contract: 68-W8-0047

Lab Code: RECNY   Case No.: 10155   SAS No.: ______   SDG No.: BT411

Matrix: (soil/water) WATER   Lab Sample ID: BT423

Sample wt/vol: 5.0 (g/mL) ML   Lab File ID: 6495

Level: (low/med) LOW   Date Received: 08/04/88

% Moisture: not dec. ____   Date Analyzed: 08/05/88

Column: (pack/cap) PACK   Dilution Factor: 1.00

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
74-87-3	Chloromethane	10	UJ
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	UJ
75-09-2	Methylene Chloride	3	BJ
67-64-1	Acetone	5	J
75-15-0	Carbon Disulfide	2	BJ
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	3	J
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	UR
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	0.1	J
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	Trans-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	UJ
79-00-5	1,1,2-Trichloroethane	5	UJ
71-43-2	Benzene	0.1	J
10061-02-6	cis-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	UJ
591-78-6	2-Hexanone	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
127-18-4	Tetrachloroethene	5	U
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	0.4	BJ
108-90-7	Chlorobenzene	5	U
100-41-4	Ethylbenzene	5	U
100-42-5	Styrene	5	U
1330-20-7	Total Xylenes	5	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET

TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BT423

568

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT423

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6495

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - Date Analyzed: 8/5/88

Column: (pack/cap) PACK Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	2:50	10	B
2. -	UNKNOWN	6:06	33	B
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FORM I VOA-TIC

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT415

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT415

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2853E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/22/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	UJ
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT415

Lab Name: RECRA ENVIRON   Contract: 68-W8-0047

Lab Code: RECNY   Case No.: 10155   SAS No.: ______   SDG No.: BT411

Matrix: (soil/water) WATER   Lab Sample ID: BT415

Sample wt/vol: 1000 (g/mL) ML   Lab File ID: 2853E

Level: (low/med) LOW   Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____   Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF   Date Analyzed: 08/22/88

GPC Cleanup: (Y/N) N   pH: 7.0   Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	UJ
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	UJ
100-02-7	4-Nitrophenol	50	UJ
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	UJ
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	UJ
91-94-1	3,3'-Dichlorobenzidine	20	UJ
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	5	J
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F

EPA SAMPLE NO.

BT415

1

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT415

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2853E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/22/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TIC's found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	LONG CHAIN COMPOUND	19:15	130	BR
2. -	UNKNOWN	26:49	19	BR
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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT415

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT415

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2853E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/22/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-07-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	5	J
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT412

Lab Name: RECRA ENVIRON   Contract: 68-W8-0047

Lab Code: RECNY   Case No.: 10155   SAS No.: ______   SDG No.: BT411

Matrix: (soil/water) SOIL   Lab Sample ID: BT412

Sample wt/vol: 30.1 (g/mL) G   Lab File ID: 2992E

Level: (low/med) LOW   Date Received: 08/04/88

% Moisture: not dec. 24   dec. ____   Date Extracted: 08/13/88

Extraction: (SepF/Cont/Sonc) SONC   Date Analyzed: 08/27/88

GPC Cleanup: (Y/N) Y   pH: 6.6   Dilution Factor: ~~20.0~~ 10

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	Concentration	Q
108-95-2	Phenol	8600	U J
111-44-4	bis(2-Chloroethyl)Ether	8600	U J
95-57-8	2-Chlorophenol	8600	U
541-73-1	1,3-Dichlorobenzene	8600	U
106-46-7	1,4-Dichlorobenzene	8600	U
100-51-6	Benzyl Alcohol	8600	U
95-50-1	1,2-Dichlorobenzene	8600	U
95-48-7	2-Methylphenol	8600	U
108-60-1	bis(2-Chloroisopropyl)Ether	8600	U
106-44-5	4-Methylphenol	8600	U
621-64-7	N-Nitroso-Di-n-Propylamine	8600	U
67-72-1	Hexachloroethane	8600	U
98-95-3	Nitrobenzene	8600	U
78-59-1	Isophorone	8600	U
88-75-5	2-Nitrophenol	8600	U
105-67-9	2,4-Dimethylphenol	8600	U
65-85-0	Benzoic Acid	42000	U J
111-91-1	bis(2-Chloroethoxy)Methane	8600	U
120-83-2	2,4-Dichlorophenol	8600	U
120-82-1	1,2,4-Trichlorobenzene	8600	U
91-20-3	Naphthalene	3700	J
106-47-8	4-Chloroaniline	8600	U
87-68-3	Hexachlorobutadiene	8600	U
59-50-7	4-Chloro-3-Methylphenol	8600	U
91-57-6	2-Methylnaphthalene	1800	J
77-47-4	Hexachlorocyclopentadiene	8600	U J
88-06-2	2,4,6-Trichlorophenol	8600	U
95-95-4	2,4,5-Trichlorophenol	42000	U
91-58-7	2-Chloronaphthalene	8600	U
88-74-4	2-Nitroaniline	42000	U
131-11-3	Dimethyl Phthalate	8600	U
208-96-8	Acenaphthylene	8600	U J

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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT412

..e: RECRA ENVIRON Contract: 68-W8-0047

..ode: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

..ix: (soil/water) SOIL Lab Sample ID: BT412

..ple wt/vol: 30.1 (g/mL) G Lab File ID: 2992E

..vel: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. 24 dec. ____ Date Extracted: 08/13/88

..traction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/27/88

..PC Cleanup: (Y/N) Y pH: 6.6 Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	42000	UJ J
83-32-9	Acenaphthene	8600	U
51-28-5	2,4-Dinitrophenol	42000	UJ
100-02-7	4-Nitrophenol	42000	U
132-64-9	Dibenzofuran	8600	U
121-14-2	2,4-Dinitrotoluene	8600	U
606-20-2	2,6-Dinitrotoluene	8600	U
84-66-2	Diethylphthalate	8600	U
7005-72-3	4-Chlorophenyl-phenylether	8600	U
86-73-7	Fluorene	8600	U
100-01-6	4-Nitroaniline	42000	UJ
534-52-1	4,6-Dinitro-2-Methylphenol	42000	UJ
86-30-6	N-Nitrosodiphenylamine (1)	8600 ~~2800~~	~~BJ~~ U
101-55-3	4-Bromophenyl-phenylether	8600	U
118-74-1	Hexachlorobenzene	8600	U
87-86-5	Pentachlorophenol	42000	UR
85-01-8	Phenanthrene	1000	J
120-12-7	Anthracene	8600	U
84-74-2	Di-n-Butylphthalate	8600	U
206-44-0	Fluoranthene	1200	J
129-00-0	Pyrene	1200	J
85-68-7	Butylbenzylphthalate	1400	J
91-94-1	3,3'-Dichlorobenzidine	17000	UJ
56-55-3	Benzo(a)Anthracene	470	J
117-81-7	bis(2-Ethylhexyl)Phthalate	5100	J
218-01-9	Chrysene	740	J
117-84-0	Di-n-Octyl Phthalate	8600	U
205-99-2	Benzo(b)Fluoranthene	8600	U
207-08-9	Benzo(k)Fluoranthene	8600	U
50-32-8	Benzo(a)Pyrene	8600	U
193-39-5	Indeno(1,2,3-cd)Pyrene	8600	U
53-70-3	Dibenz(a,h)Anthracene	8600	U
191-24-2	Benzo(g,h,i)Perylene	8600	U

(1) - Cannot be separated from Diphenylamine

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO

BT412

Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ____ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT412

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 2992E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. 24 dec. ____ Date Extracted: 08/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/27/88

GPC Cleanup: (Y/N) Y pH: 6.6 Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	4300	U
111-44-4	bis(2-Chloroethyl)Ether	4300	U
95-57-8	2-Chlorophenol	4300	U
541-73-1	1,3-Dichlorobenzene	4300	U
106-46-7	1,4-Dichlorobenzene	4300	U
100-51-6	Benzyl Alcohol	4300	U
95-50-1	1,2-Dichlorobenzene	4300	U
95-48-7	2-Methylphenol	4300	U
108-60-1	bis(2-Chloroisopropyl)Ether	4300	U
106-44-5	4-Methylphenol	4300	U
621-64-7	N-Nitroso-Di-n-Propylamine	4300	U
67-72-1	Hexachloroethane	4300	U
98-95-3	Nitrobenzene	4300	U
78-59-1	Isophorone	4300	U
88-75-5	2-Nitrophenol	4300	U
105-67-9	2,4-Dimethylphenol	4300	U
65-85-0	Benzoic Acid	21000	U
111-91-1	bis(2-Chloroethoxy)Methane	4300	U
120-83-2	2,4-Dichlorophenol	4300	U
120-82-1	1,2,4-Trichlorobenzene	4300	U
91-20-3	Naphthalene	3700	J
106-47-8	4-Chloroaniline	4300	U
87-68-3	Hexachlorobutadiene	4300	U
59-50-7	4-Chloro-3-Methylphenol	4300	U
91-57-6	2-Methylnaphthalene	1800	J
77-47-4	Hexachlorocyclopentadiene	4300	U
88-06-2	2,4,6-Trichlorophenol	4300	U
95-95-4	2,4,5-Trichlorophenol	21000	U
91-58-7	2-Chloronaphthalene	4300	U
88-74-4	2-Nitroaniline	21000	U
131-11-3	Dimethyl Phthalate	4300	U
208-96-8	Acenaphthylene	4300	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT412

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT412

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 2992E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. 24 dec. ____ Date Extracted: 08/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/27/88

GPC Cleanup: (Y/N) Y pH: 6.6 Dilution Factor: 10.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	CONCENTRATION	Q
99-09-2	3-Nitroaniline	21000	U
83-32-9	Acenaphthene	4300	U
51-28-5	2,4-Dinitrophenol	21000	U
100-02-7	4-Nitrophenol	21000	U
132-64-9	Dibenzofuran	4300	U
121-14-2	2,4-Dinitrotoluene	4300	U
606-20-2	2,6-Dinitrotoluene	4300	U
84-66-2	Diethylphthalate	4300	U
7005-72-3	4-Chlorophenyl-phenylether	4300	U
86-73-7	Fluorene	4300	U
100-07-6	4-Nitroaniline	21000	U
534-52-1	4,6-Dinitro-2-Methylphenol	21000	U
86-30-6	N-Nitrosodiphenylamine (1)	2800	BJ
101-55-3	4-Bromophenyl-phenylether	4300	U
118-74-1	Hexachlorobenzene	4300	U
87-86-5	Pentachlorophenol	21000	U
85-01-8	Phenanthrene	1000	J
120-12-7	Anthracene	4300	U
84-74-2	Di-n-Butylphthalate	4300	U
206-44-0	Fluoranthene	1200	J
129-00-0	Pyrene	1200	J
85-68-7	Butylbenzylphthalate	1400	J
91-94-1	3,3'-Dichlorobenzidine	8700	U
56-55-3	Benzo(a)Anthracene	470	J
117-81-7	bis(2-Ethylhexyl)Phthalate	5100	
218-01-9	Chrysene	740	J
117-84-0	Di-n-Octyl Phthalate	4300	U
205-99-2	Benzo(b)Fluoranthene	4300	U
207-08-9	Benzo(k)Fluoranthene	4300	U
50-32-8	Benzo(a)Pyrene	4300	U
193-39-5	Indeno(1,2,3-cd)Pyrene	4300	U
53-70-3	Dibenz(a,h)Anthracene	4300	U
191-24-2	Benzo(g,h,i)Perylene	4300	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BT412

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT412

Sample wt/vol: 30.1 (g/mL) G Lab File ID: 2992E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. 24 dec. - Date Extracted: 8/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 8/27/88

GPC Cleanup: (Y/N) Y pH: 6.6 Dilution Factor: 10.0

CONCENTRATION UNITS:
Number TIC's found: 20 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	3:35	45,000	
2. -	ALKYL HYDROCARBON	3:59	180,000	
3. -	UNKNOWN	4:04	98,000	
4. -	UNKNOWN	4:14	99,000	
5. -	UNKNOWN	4:19	270,000	
6. -	UNKNOWN	4:25	180,000	
7. -	UNKNOWN	4:35	130,000	
8. -	UNKNOWN	4:46	260,000	
9. -	ALKYL HYDROCARBON	5:12	130,000	
10. -	UNKNOWN	5:26	180,000	BR
11. -	UNKNOWN	5:31	160,000	
12. -	ALKYL SUBSTITUTED COMPOUND	5:58	120,000	
13. -	ALKYL HYDROCARBON	7:14	66,000	
14. -	ALKYL HYDROCARBON	7:24	37,000	
15. -	ALKYL HYDROCARBON	8:38	38,000	
16. -	ALKYL HYDROCARBON	10:07	37,000	
17. -	UNKNOWN	22:03	24,000	
18. -	UNKNOWN	23:07	23,000	
19. -	UNKNOWN	23:33	71,000	
20. -	UNKNOWN	32:05	110,000	
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1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT416

Name: RECRA ENVIRON Contract: 68-W8-0047

.b Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

.atrix: (soil/water) WATER Lab Sample ID: BT416

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2815E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/18/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	UJ
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	UJ
100-02-7	4-Nitrophenol	50	UJ
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	UJ
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	~~BJ~~ U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	UJ
91-94-1	3,3'-Dichlorobenzidine	20	UJ
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	UJ
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT416

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT416

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2815E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/18/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	UJ
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	UJ
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT416

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT416

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2815E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/18/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-07-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	4	BJ
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.: BT416

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT416

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2815E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/18/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TIC's found: 10

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	-	UNKNOWN ALCOHOL	19:06	29	B
2.	-	ALKYL SUBSTITUTED COMPOUND	19:15	22	
3.	-	ALKYL HYDROCARBON	19:55	10	
4.	-	UNKNOWN	20:27	9	
5.	-	ALKYL SUBSTITUTED COMPOUND	21:07	19	
6.	-	ALKYL HYDROCARBON	22:01	18	
7.	-	UNKNOWN	22:16	12	
8.	-	ALKYL HYDROCARBON	23:55	33	
9.	-	UNKNOWN	24:28	38	
10.	-	ALKYL HYDROCARBON	25:28	17	
11.					
12.					
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1073

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

B 413

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No. BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT413

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 2995E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. 22 dec. ____ Date Extracted: 08/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/27/88

GPC Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: 5 ~~2.0~~

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	7800	J J
111-44-4	bis(2-Chloroethyl)Ether	8400	UJ
95-57-8	2-Chlorophenol	8400	U
541-73-1	1,3-Dichlorobenzene	8400	U
106-46-7	1,4-Dichlorobenzene	8400	U
100-51-6	Benzyl Alcohol	8400	U
95-50-1	1,2-Dichlorobenzene	8400	U
95-48-7	2-Methylphenol	8400	U
108-60-1	bis(2-Chloroisopropyl)Ether	8400	U
106-44-5	4-Methylphenol	8400	U
621-64-7	N-Nitroso-Di-n-Propylamine	8400	U
67-72-1	Hexachloroethane	8400	U
98-95-3	Nitrobenzene	8400	U
78-59-1	Isophorone	8400	U
88-75-5	2-Nitrophenol	8400	U
105-67-9	2,4-Dimethylphenol	8400	U
65-85-0	Benzoic Acid	41000	UJ
111-91-1	bis(2-Chloroethoxy)Methane	8400	U
120-83-2	2,4-Dichlorophenol	8400	U
120-82-1	1,2,4-Trichlorobenzene	8400	U
91-20-3	Naphthalene	8400	U
106-47-8	4-Chloroaniline	8400	U
87-68-3	Hexachlorobutadiene	8400	U
59-50-7	4-Chloro-3-Methylphenol	8400	U
91-57-6	2-Methylnaphthalene	8400	U
77-47-4	Hexachlorocyclopentadiene	8400	UJ
88-06-2	2,4,6-Trichlorophenol	8400	U
95-95-4	2,4,5-Trichlorophenol	41000	U
91-58-7	2-Chloronaphthalene	8400	U
88-74-4	2-Nitroaniline	41000	U
131-11-3	Dimethyl Phthalate	8400	U
208-96-8	Acenaphthylene	8400	U

Attachment #1

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.: BT413

Name: RECRA ENVIRON   Contract: 68-W8-0047

ab Code: RECNY   Case No.: 10155   SAS No.: ______   SDG No.: BT411

Matrix: (soil/water) SOIL   Lab Sample ID: BT413

Sample wt/vol: 30.2 (g/mL) G   Lab File ID: 2995E

Level: (low/med) LOW   Date Received: 08/04/88

% Moisture: not dec. 22   dec. ____   Date Extracted: 08/13/88

Extraction: (SepF/Cont/Sonc) SONC   Date Analyzed: 08/27/88

GPC Cleanup: (Y/N) Y   pH: 6.9   Dilution Factor: ~~20.0~~ 10

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	CONCENTRATION	Q
99-09-2	3-Nitroaniline	41000	U J
83-32-9	Acenaphthene	8400	U
51-28-5	2,4-Dinitrophenol	41000	U J
100-02-7	4-Nitrophenol	41000	U
132-64-9	Dibenzofuran	8400	U
121-14-2	2,4-Dinitrotoluene	8400	U
606-20-2	2,6-Dinitrotoluene	8400	U
84-66-2	Diethylphthalate	8400	U
7005-72-3	4-Chlorophenyl-phenylether	8400	U
86-73-7	Fluorene	8400	U
100-01-6	4-Nitroaniline	41000	U J
534-52-1	4,6-Dinitro-2-Methylphenol	41000	U J
86-30-6	N-Nitrosodiphenylamine (1)	8400 ~~2900~~	~~BJ~~ U
101-55-3	4-Bromophenyl-phenylether	8400	U
118-74-1	Hexachlorobenzene	8400	U
87-86-5	Pentachlorophenol	41000	U
85-01-8	Phenanthrene	1200	J
120-12-7	Anthracene	380	J
84-74-2	Di-n-Butylphthalate	8400 ~~500~~	~~BJ~~ U
206-44-0	Fluoranthene	1700	J
129-00-0	Pyrene	2700	J
85-68-7	Butylbenzylphthalate	3500	J
91-94-1	3,3'-Dichlorobenzidine	17000	U J
56-55-3	Benzo(a)Anthracene	1300	J
117-81-7	bis(2-Ethylhexyl)Phthalate	17000	J
218-01-9	Chrysene	1600	J
117-84-0	Di-n-Octyl Phthalate	8400	U
205-99-2	Benzo(b)Fluoranthene	2100	J
207-08-9	Benzo(k)Fluoranthene	8400	U
50-32-8	Benzo(a)Pyrene	1300	J
193-39-5	Indeno(1,2,3-cd)Pyrene	660	J
53-70-3	Dibenz(a,h)Anthracene	8400	U
191-24-2	Benzo(g,h,i)Perylene	720	J

(1) - Cannot be separated from Diphenylamine

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT413

ab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT413

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 2995E

Level: (low/med) LOW Date Received: 08/04/88

Moisture: not dec. 22 dec. ____ Date Extracted: 08/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/27/88

PC Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: 10.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	7800	
111-44-4	bis(2-Chloroethyl)Ether	4200	U
95-57-8	2-Chlorophenol	4200	U
541-73-1	1,3-Dichlorobenzene	4200	U
106-46-7	1,4-Dichlorobenzene	4200	U
100-51-6	Benzyl Alcohol	4200	U
95-50-1	1,2-Dichlorobenzene	4200	U
95-48-7	2-Methylphenol	4200	U
108-60-1	bis(2-Chloroisopropyl)Ether	4200	U
106-44-5	4-Methylphenol	4200	U
621-64-7	N-Nitroso-Di-n-Propylamine	4200	U
67-72-1	Hexachloroethane	4200	U
98-95-3	Nitrobenzene	4200	U
78-59-1	Isophorone	4200	U
88-75-5	2-Nitrophenol	4200	U
105-67-9	2,4-Dimethylphenol	4200	U
65-85-0	Benzoic Acid	20000	U
111-91-1	bis(2-Chloroethoxy)Methane	4200	U
120-83-2	2,4-Dichlorophenol	4200	U
120-82-1	1,2,4-Trichlorobenzene	4200	U
91-20-3	Naphthalene	4200	U
106-47-8	4-Chloroaniline	4200	U
87-68-3	Hexachlorobutadiene	4200	U
59-50-7	4-Chloro-3-Methylphenol	4200	U
91-57-6	2-Methylnaphthalene	4200	U
77-47-4	Hexachlorocyclopentadiene	4200	U
88-06-2	2,4,6-Trichlorophenol	4200	U
95-95-4	2,4,5-Trichlorophenol	20000	U
91-58-7	2-Chloronaphthalene	4200	U
88-74-4	2-Nitroaniline	20000	U
131-11-3	Dimethyl Phthalate	4200	U
208-96-8	Acenaphthylene	4200	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT413

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT413

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 2995E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. 22 dec. ____ Date Extracted: 08/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/27/88

GPC Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: 10.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	20000	U
83-32-9	Acenaphthene	4200	U
51-28-5	2,4-Dinitrophenol	20000	U
100-02-7	4-Nitrophenol	20000	U
132-64-9	Dibenzofuran	4200	U
121-14-2	2,4-Dinitrotoluene	4200	U
606-20-2	2,6-Dinitrotoluene	4200	U
84-66-2	Diethylphthalate	4200	U
7005-72-3	4-Chlorophenyl-phenylether	4200	U
86-73-7	Fluorene	4200	U
100-07-6	4-Nitroaniline	20000	U
534-52-1	4,6-Dinitro-2-Methylphenol	20000	U
86-30-6	N-Nitrosodiphenylamine (1)	2900	BJ
101-55-3	4-Bromophenyl-phenylether	4200	U
118-74-1	Hexachlorobenzene	4200	U
87-86-5	Pentachlorophenol	20000	U
85-01-8	Phenanthrene	1200	J
120-12-7	Anthracene	380	J
84-74-2	Di-n-Butylphthalate	500	BJ
206-44-0	Fluoranthene	1700	J
129-00-0	Pyrene	2700	J
85-68-7	Butylbenzylphthalate	3500	J
91-94-1	3,3'-Dichlorobenzidine	8400	U
56-55-3	Benzo(a)Anthracene	1300	J
117-81-7	bis(2-Ethylhexyl)Phthalate	17000	
218-01-9	Chrysene	1600	J
117-84-0	Di-n-Octyl Phthalate	4200	U
205-99-2	Benzo(b)Fluoranthene	2100	J
207-08-9	Benzo(k)Fluoranthene	4200	U
50-32-8	Benzo(a)Pyrene	1300	J
193-39-5	Indeno(1,2,3-cd)Pyrene	660	J
53-70-3	Dibenz(a,h)Anthracene	4200	U
191-24-2	Benzo(g,h,i)Perylene	720	J

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BT413

1095

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT413

Sample wt/vol: 30.2 (g/mL) G Lab File ID: 2995E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. 22 dec. - Date Extracted: 8/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 8/27/88

GPC Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: 10.00

CONCENTRATION UNITS:
Number TIC's found: 20 (ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	ALKYL HYDROCARBON	4:58	12,000	
2. -	UNKNOWN	5:53	11,000	
3. -	UNKNOWN	8:37	5,900	
4. -	ALKYL SUBSTITUTED COMPOUND	11:38	5,100	
5. -	UNKNOWN	13:07	5,100	
6. -	ALKYL HYDROCARBON	13:49	5,100	
7. -	ALKYL SUBSTITUTED COMPOUND	14:33	7,600	B~~R~~
8. -	LONG CHAIN COMPOUND	14:38	9,300	
9. -	ALKYL HYDROCARBON	15:56	12,000	
10. -	ALKYL SUBSTITUTED COMPOUND	16:04	15,000	
11. -	ALKYL HYDROCARBON	17:16	18,000	
12. -	ALKYL SUBSTITUTED COMPOUND	18:32	18,000	
13. -	UNKNOWN	18:52	6,800	
14. -	ALKYL HYDROCARBON	19:45	15,000	
15. -	ALKYL HYDROCARBON	20:54	11,000	
16. -	UNKNOWN	22:01	11,000	
17. -	ALKYL HYDROCARBON	23:06	11,000	
18. -	UNKNOWN	24:08	13,000	
19. -	ALKYL HYDROCARBON	26:06	20,000	
20. -	ALKYL SUBSTITUTED COMPOUND	32:49	25,000	B~~R~~
21.				
22.				
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 14.0

BT417

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT417

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2826E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/19/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U J
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT417

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT417

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2826E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/19/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	UJ
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	UJ
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	UJ
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10 ~~8~~	~~BJ~~ u
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	8	J
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	UJ
91-94-1	3,3'-Dichlorobenzidine	20	UJ
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT417

Lab Name: RECRA ENVIRON   Contract: 68-W8-0047

Lab Code: RECNY   Case No.: 10155   SAS No.: ____   SDG No.: BT411

Matrix: (soil/water) WATER   Lab Sample ID: BT417

Sample wt/vol: 1000 (g/mL) ML   Lab File ID: 2826E

Level: (low/med) LOW   Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____   Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF   Date Analyzed: 08/19/88

GPC Cleanup: (Y/N) N   pH: 7.0   Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-07-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	3	BJ
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	8	J
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1231

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT414

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT414

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2996E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. 22 dec. ____ Date Extracted: 08/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/27/88

GPC Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: ~~20.0~~ 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	40000	UJ
83-32-9	Acenaphthene	8300	U
51-28-5	2,4-Dinitrophenol	40000	UJ
100-02-7	4-Nitrophenol	40000	U
132-64-9	Dibenzofuran	8300	U
121-14-2	2,4-Dinitrotoluene	8300	U
606-20-2	2,6-Dinitrotoluene	8300	U
84-66-2	Diethylphthalate	8300	U
7005-72-3	4-Chlorophenyl-phenylether	8300	U
86-73-7	Fluorene	8300	U
100-01-6	4-Nitroaniline	40000	UJ
534-52-1	4,6-Dinitro-2-Methylphenol	40000	UJ
86-30-6	N-Nitrosodiphenylamine (1)	8300 ~~2800~~	~~BJ~~ U
101-55-3	4-Bromophenyl-phenylether	8300	U
118-74-1	Hexachlorobenzene	8300	U
87-86-5	Pentachlorophenol	40000	U
85-01-8	Phenanthrene	610	J
120-12-7	Anthracene	8300	U
84-74-2	Di-n-Butylphthalate	8300	U
206-44-0	Fluoranthene	970	J
129-00-0	Pyrene	1100	J
85-68-7	Butylbenzylphthalate	3700	J
91-94-1	3,3'-Dichlorobenzidine	17000	UJ
56-55-3	Benzo(a)Anthracene	520	J
117-81-7	bis(2-Ethylhexyl)Phthalate	4100	J
218-01-9	Chrysene	810	J
117-84-0	Di-n-Octyl Phthalate	130	J
205-99-2	Benzo(b)Fluoranthene	8300	U
207-08-9	Benzo(k)Fluoranthene	8300	U
50-32-8	Benzo(a)Pyrene	8300	U
193-39-5	Indeno(1,2,3-cd)Pyrene	8300	U
53-70-3	Dibenz(a,h)Anthracene	8300	U
191-24-2	Benzo(g,h,i)Perylene	8300	U

(1) - Cannot be separated from Diphenylamine

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT414

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT414

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2996E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. 22 dec. ____ Date Extracted: 08/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/27/88

GPC Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: 10.0

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NO.	COMPOUND	(ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	10000	
111-44-4	bis(2-Chloroethyl)Ether	4200	U
95-57-8	2-Chlorophenol	4200	U
541-73-1	1,3-Dichlorobenzene	4200	U
106-46-7	1,4-Dichlorobenzene	4200	U
100-51-6	Benzyl Alcohol	4200	U
95-50-1	1,2-Dichlorobenzene	4200	U
95-48-7	2-Methylphenol	4200	U
108-60-1	bis(2-Chloroisopropyl)Ether	4200	U
106-44-5	4-Methylphenol	4200	U
621-64-7	N-Nitroso-Di-n-Propylamine	4200	U
67-72-1	Hexachloroethane	4200	U
98-95-3	Nitrobenzene	4200	U
78-59-1	Isophorone	4200	U
88-75-5	2-Nitrophenol	4200	U
105-67-9	2,4-Dimethylphenol	4200	U
65-85-0	Benzoic Acid	20000	U
111-91-1	bis(2-Chloroethoxy)Methane	4200	U
120-83-2	2,4-Dichlorophenol	4200	U
120-82-1	1,2,4-Trichlorobenzene	4200	U
91-20-3	Naphthalene	4200	U
106-47-8	4-Chloroaniline	4200	U
87-68-3	Hexachlorobutadiene	4200	U
59-50-7	4-Chloro-3-Methylphenol	4200	U
91-57-6	2-Methylnaphthalene	170	J
77-47-4	Hexachlorocyclopentadiene	4200	U
88-06-2	2,4,6-Trichlorophenol	4200	U
95-95-4	2,4,5-Trichlorophenol	20000	U
91-58-7	2-Chloronaphthalene	4200	U
88-74-4	2-Nitroaniline	20000	U
131-11-3	Dimethyl Phthalate	4200	U
208-96-8	Acenaphthylene	4200	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT414

Name: RECRA ENVIRON Contract: 68-W8-0047

code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

:rix: (soil/water) SOIL Lab Sample ID: BT414

ample wt/vol: 30.4 (g/mL) G Lab File ID: 2996E

el: (low/med) LOW Date Received: 08/04/88

Moisture: not dec. 22 dec. ____ Date Extracted: 08/13/88

raction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/27/88

P Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
99-09-2	3-Nitroaniline	20000	U
83-32-9	Acenaphthene	4200	U
51-28-5	2,4-Dinitrophenol	20000	U
100-02-7	4-Nitrophenol	20000	U
132-64-9	Dibenzofuran	4200	U
121-14-2	2,4-Dinitrotoluene	4200	U
606-20-2	2,6-Dinitrotoluene	4200	U
84-66-2	Diethylphthalate	4200	U
7005-72-3	4-Chlorophenyl-phenylether	4200	U
86-73-7	Fluorene	4200	U
100-07-6	4-Nitroaniline	20000	U
534-52-1	4,6-Dinitro-2-Methylphenol	20000	U
86-30-6	N-Nitrosodiphenylamine (1)	2800	BJ
101-55-3	4-Bromophenyl-phenylether	4200	U
118-74-1	Hexachlorobenzene	4200	U
87-86-5	Pentachlorophenol	20000	U
85-01-8	Phenanthrene	610	J
120-12-7	Anthracene	4200	U
84-74-2	Di-n-Butylphthalate	4200	U
206-44-0	Fluoranthene	970	J
129-00-0	Pyrene	1100	J
85-68-7	Butylbenzylphthalate	3700	J
91-94-1	3,3'-Dichlorobenzidine	8300	U
56-55-3	Benzo(a)Anthracene	520	J
117-81-7	bis(2-Ethylhexyl)Phthalate	4100	J
218-01-9	Chrysene	810	J
117-84-0	Di-n-Octyl Phthalate	130	J
205-99-2	Benzo(b)Fluoranthene	4200	U
207-08-9	Benzo(k)Fluoranthene	4200	U
50-32-8	Benzo(a)Pyrene	4200	U
193-39-5	Indeno(1,2,3-cd)Pyrene	4200	U
53-70-3	Dibenz(a,h)Anthracene	4200	U
191-24-2	Benzo(g,h,i)Perylene	4200	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BT414

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT414

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2996E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. 22 dec. - Date Extracted: 8/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 8/27/88

GPC Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: 10.00

Number TIC's found: 20

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER		COMPOUND NAME	RT	EST. CONC.	Q
1.	-	ALKYL HYDROCARBON	5:53	10,000	
2.	-	ALKYL SUBSTITUTED COMPOUND	8:38	11,000	
3.	-	ALKYL HYDROCARBON	10:08	10,000	
4.	-	ALKYL HYDROCARBON	11:38	8,400	
5.	-	UNKNOWN	16:06	8,400	
6.	-	ALKYL HYDROCARBON	20:55	7,600	
7.	-	ALKYL HYDROCARBON	22:02	10,000	
8.	-	ALKYL SUBSTITUTED COMPOUND	23:07	15,000	
9.	-	ALKYL SUBSTITUTED COMPOUND	24:09	19,000	
10.	-	LONG CHAIN COMPOUND	25:09	24,000	
11.	-	LONG CHAIN COMPOUND	26:08	17,000	
12.	-	UNKNOWN	27:03	24,000	B
13.	-	UNKNOWN	28:38	23,000	
14.	-	LONG CHAIN COMPOUND	28:53	30,000	B
15.	-	UNKNOWN	30:21	19,000	B
16.	-	UNKNOWN	31:10	13,000	
17.	-	UNKNOWN	31:17	19,000	
18.	-	UNKNOWN	32:13	21,000	
19.	-	UNKNOWN	32:53	9,300	
20.	-	UNKNOWN	33:29	10,000	
21.					
22.					
23.					
24.					
25.					
26.					
27.					
28.					
29.					
30.					

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BT417

1432

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT417

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2826E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/19/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CONCENTRATION UNITS:

Number TIC's found: 11 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	18:06	10	
2. -	UNKNOWN	19:05	54	
3. -	UNKNOWN	19:56	10	
4. -	UNKNOWN	21:07	24	
5. -	UNKNOWN	22:01	24	
6. -	UNKNOWN	22:54	9	
7. -	UNKNOWN	22:59	11	
8. -	ALKYL HYDROCARBON	23:55	23	
9. -	ALKYL SUBSTITUTED COMPOUND	24:28	29	
10. -	ALKYL HYDROCARBON	25:29	21	
11. -	ALKYL SUBSTITUTED COMPOUND	29:28	9	
12.				
13.				
14.				
15.				
16.				
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1230

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT414

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT414

Sample wt/vol: 30.4 (g/mL) G Lab File ID: 2996E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. 22 dec. ____ Date Extracted: 08/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 08/27/88

GPC Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: ~~2.0~~ 10

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
108-95-2	Phenol	10000	J
111-44-4	bis(2-Chloroethyl)Ether	8300	U
95-57-8	2-Chlorophenol	8300	U
541-73-1	1,3-Dichlorobenzene	8300	U
106-46-7	1,4-Dichlorobenzene	8300	U
100-51-6	Benzyl Alcohol	8300	U
95-50-1	1,2-Dichlorobenzene	8300	U
95-48-7	2-Methylphenol	8300	U
108-60-1	bis(2-Chloroisopropyl)Ether	8300	U
106-44-5	4-Methylphenol	8300	U
621-64-7	N-Nitroso-Di-n-Propylamine	8300	U
67-72-1	Hexachloroethane	8300	U
98-95-3	Nitrobenzene	8300	U
78-59-1	Isophorone	8300	U
88-75-5	2-Nitrophenol	8300	U
105-67-9	2,4-Dimethylphenol	8300	U
65-85-0	Benzoic Acid	40000	U
111-91-1	bis(2-Chloroethoxy)Methane	8300	U
120-83-2	2,4-Dichlorophenol	8300	U
120-82-1	1,2,4-Trichlorobenzene	8300	U
91-20-3	Naphthalene	8300	U
106-47-8	4-Chloroaniline	8300	U
87-68-3	Hexachlorobutadiene	8300	U
59-50-7	4-Chloro-3-Methylphenol	8300	U
91-57-6	2-Methylnaphthalene	170	J
77-47-4	Hexachlorocyclopentadiene	8300	U
88-06-2	2,4,6-Trichlorophenol	8300	U
95-95-4	2,4,5-Trichlorophenol	40000	U
91-58-7	2-Chloronaphthalene	8300	U
88-74-4	2-Nitroaniline	40000	U
131-11-3	Dimethyl Phthalate	8300	U
208-96-8	Acenaphthylene	8300	U

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT418

Lab Name: RECRA ENVIRON   Contract: 68-W8-0047

Lab Code: RECNY   Case No.: 10155   SAS No.: ______   SDG No.: BT411

Matrix: (soil/water) WATER   Lab Sample ID: BT418

Sample wt/vol: 1000 (g/mL) ML   Lab File ID: 2817E

Level: (low/med) LOW   Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____   Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF   Date Analyzed: 08/18/88

GPC Cleanup: (Y/N) N   pH: 7.0   Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	UJ
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	UJ
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT418

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

ab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT418

ample wt/vol: 1000 (g/mL) ML Lab File ID: 2817E

Level: (low/med) LOW Date Received: 08/04/88

Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

xtraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/18/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	UJ
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	UJ
100-02-7	4-Nitrophenol	50	UJ
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	UJ
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10 ~~2~~	~~BJ~~ U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	UJ
91-94-1	3,3'-Dichlorobenzidine	20	UJ
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	UJ
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT418

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT418

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2817E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/18/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-07-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	2	BJ
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BT418

1493

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT418

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2817E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/18/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TIC's found: 1

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN ALCOHOL	19:05	40	~~B~~
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT419

b Name: RECRA ENVIRON   Contract: 68-W8-0047

ab Code: RECNY   Case No.: 10155   SAS No.: ____   SDG No.: BT411

trix: (soil/water) WATER   Lab Sample ID: BT419

ample wt/vol: 1000 (g/mL) ML   Lab File ID: 2890E

vel: (low/med) LOW   Date Received: 08/04/88

Moisture: not dec. ____ dec. ____   Date Extracted: 08/05/88

xtraction: (SepF/Cont/Sonc) SEPF   Date Analyzed: 08/23/88

C Cleanup: (Y/N) N   pH: 7.0   Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U J
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U J
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U J
67-72-1	Hexachloroethane	10	U J
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U J
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT419

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT419

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2890E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/23/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	UJ
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	UJ
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	UJ
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	~~3~~ 10	~~BJ~~ U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	UJ
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT419

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT419

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2890E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/23/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-07-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	1	BJ
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BT419

1511

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT419

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2890E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/23/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CONCENTRATION UNITS:
Number TIC's found: 2 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	20:04	72	
2. -	UNKNOWN	26:41	22	~~BX~~
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840

EPA SAMPLE NO.

BT411

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT411

Sample wt/vol: 800 (g/mL) ML Lab File ID: 2829E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/19/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 20.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	*3700 D ~~29000~~	~~E~~ J
111-44-4	bis(2-Chloroethyl)Ether	250	U
95-57-8	2-Chlorophenol	250	U
541-73-1	1,3-Dichlorobenzene	250	U
106-46-7	1,4-Dichlorobenzene	250	U
100-51-6	Benzyl Alcohol	770	
95-50-1	1,2-Dichlorobenzene	250	U
95-48-7	2-Methylphenol	320	
108-60-1	bis(2-Chloroisopropyl)Ether	250	U
106-44-5	4-Methylphenol	340	
621-64-7	N-Nitroso-Di-n-Propylamine	250	U
67-72-1	Hexachloroethane	250	U
98-95-3	Nitrobenzene	250	U
78-59-1	Isophorone	250	U
88-75-5	2-Nitrophenol	250	U
105-67-9	2,4-Dimethylphenol	250	U
65-85-0	Benzoic Acid	1300	U
111-91-1	bis(2-Chloroethoxy)Methane	250	U
120-83-2	2,4-Dichlorophenol	250	U
120-82-1	1,2,4-Trichlorobenzene	250	U
91-20-3	Naphthalene	250	U
106-47-8	4-Chloroaniline	250	U
87-68-3	Hexachlorobutadiene	250	U
59-50-7	4-Chloro-3-Methylphenol	250	U
91-57-6	2-Methylnaphthalene	45	J
77-47-4	Hexachlorocyclopentadiene	250	U
88-06-2	2,4,6-Trichlorophenol	250	U
95-95-4	2,4,5-Trichlorophenol	1300	U
91-58-7	2-Chloronaphthalene	250	U
88-74-4	2-Nitroaniline	1300	U
131-11-3	Dimethyl Phthalate	250	U
208-96-8	Acenaphthylene	250	U J

*transferred from 4:DL

J due to surr. [illegible] & estimated

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT411

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT411

Sample wt/vol: 800 (g/mL) ML Lab File ID: 2829E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/19/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 20.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION (UG/L)	Q
99-09-2	3-Nitroaniline	1300	U J
83-32-9	Acenaphthene	250	U
51-28-5	2,4-Dinitrophenol	1300	U
100-02-7	4-Nitrophenol	1300	U
132-64-9	Dibenzofuran	250	U
121-14-2	2,4-Dinitrotoluene	250	U
606-20-2	2,6-Dinitrotoluene	250	U
84-66-2	Diethylphthalate	250	U
7005-72-3	4-Chlorophenyl-phenylether	250	U
86-73-7	Fluorene	250	U
100-01-6	4-Nitroaniline	1300	U
534-52-1	4,6-Dinitro-2-Methylphenol	1300	U
86-30-6	N-Nitrosodiphenylamine (1)	250 ~~150~~	~~BJ~~ U
101-55-3	4-Bromophenyl-phenylether	250	U
118-74-1	Hexachlorobenzene	250	U
87-86-5	Pentachlorophenol	1300	U
85-01-8	Phenanthrene	250	U
120-12-7	Anthracene	250	U
84-74-2	Di-n-Butylphthalate	160	J
206-44-0	Fluoranthene	250	U
129-00-0	Pyrene	250	U
85-68-7	Butylbenzylphthalate	7100	
91-94-1	3,3'-Dichlorobenzidine	500	U
56-55-3	Benzo(a)Anthracene	250	U
117-81-7	bis(2-Ethylhexyl)Phthalate	1100	
218-01-9	Chrysene	250	U
117-84-0	Di-n-Octyl Phthalate	45	J
205-99-2	Benzo(b)Fluoranthene	250	U
207-08-9	Benzo(k)Fluoranthene	250	U
50-32-8	Benzo(a)Pyrene	250	U
193-39-5	Indeno(1,2,3-cd)Pyrene	250	U
53-70-3	Dibenz(a,h)Anthracene	250	U
191-24-2	Benzo(g,h,i)Perylene	250	U J

(1) - Cannot be separated from Diphenylamine

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT411

Name: RECRA ENVIRON Contract: 68-W8-0047

Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

atrix: (soil/water) WATER Lab Sample ID: BT411

Sample wt/vol: 800 (g/mL) ML Lab File ID: 2829E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/19/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 20.0

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION (UG/L)	Q
99-09-2	3-Nitroaniline	1300	U
83-32-9	Acenaphthene	250	U
51-28-5	2,4-Dinitrophenol	1300	U
100-02-7	4-Nitrophenol	1300	U
132-64-9	Dibenzofuran	250	U
121-14-2	2,4-Dinitrotoluene	250	U
606-20-2	2,6-Dinitrotoluene	250	U
84-66-2	Diethylphthalate	250	U
7005-72-3	4-Chlorophenyl-phenylether	250	U
86-73-7	Fluorene	250	U
100-07-6	4-Nitroaniline	1300	U
534-52-1	4,6-Dinitro-2-Methylphenol	1300	U
86-30-6	N-Nitrosodiphenylamine (1)	150	BJ
101-55-3	4-Bromophenyl-phenylether	250	U
118-74-1	Hexachlorobenzene	250	U
87-86-5	Pentachlorophenol	1300	U
85-01-8	Phenanthrene	250	U
120-12-7	Anthracene	250	U
84-74-2	Di-n-Butylphthalate	160	J
206-44-0	Fluoranthene	250	U
129-00-0	Pyrene	250	U
85-68-7	Butylbenzylphthalate	7100	
91-94-1	3,3'-Dichlorobenzidine	500	U
56-55-3	Benzo(a)Anthracene	250	U
117-81-7	bis(2-Ethylhexyl)Phthalate	1100	
218-01-9	Chrysene	250	U
117-84-0	Di-n-Octyl Phthalate	45	J
205-99-2	Benzo(b)Fluoranthene	250	U
207-08-9	Benzo(k)Fluoranthene	250	U
50-32-8	Benzo(a)Pyrene	250	U
193-39-5	Indeno(1,2,3-cd)Pyrene	250	U
53-70-3	Dibenz(a,h)Anthracene	250	U
191-24-2	Benzo(g,h,i)Perylene	250	U

(1) - Cannot be separated from Diphenylamine

1F

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BT411

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT411

Sample wt/vol: 800 (g/mL) ML Lab File ID: 2829E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/19/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 20.0

CONCENTRATION UNITS:
Number TIC's found: 20 (ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	-	FURAN DERIVATIVE	4:04	48000	
2.	-	UNKNOWN	4:44	9200	
3.	-	FURAN DERIVATIVE	5:39	4100	
4.	-	UNKNOWN	8:37	5000	
5.	-	UNKNOWN	10:33	4100	
6.	-	ALKYL SUBSTITUTED COMPOUND	18:22	4000	
7.	-	UNKNOWN	18:26	3100	
8.	-	UNKNOWN	19:35	5600	
9.	-	UNKNOWN	20:45	4800	
10.	-	UNKNOWN	21:52	5300	
11.	-	AROMATIC COMPOUND	22:31	6400	
12.	-	LONG CHAIN HYDROCARBON	22:57	5600	
13.	-	ALKYL HYDROCARBON	23:59	5200	
14.	-	UNKNOWN	24:11	3200	
15.	-	LONG CHAIN COMPOUND	24:58	4800	
16.	-	LONG CHAIN COMPOUND	25:56	2600	
17.	-	UNKNOWN	26:00	1000	
18.	-	LONG CHAIN COMPOUND	26:51	2300	
19.	-	UNKNOWN	28:38	1600	
20.	-	UNKNOWN	29:40	1300	
21.					
22.					
23.					
24.					
25.					
26.					
27.					
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EPA SAMPLE NO.

BT411DL

1B

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT411DL

Sample wt/vol: 800 (g/mL) ML Lab File ID: 3110E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 09/01/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 200

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND	CONCENTRATION (UG/L)	Q
108-95-2	Phenol	3700	D
111-44-4	bis(2-Chloroethyl)Ether	2500	U
95-57-8	2-Chlorophenol	2500	U
541-73-1	1,3-Dichlorobenzene	2500	U
106-46-7	1,4-Dichlorobenzene	2500	U
100-51-6	Benzyl Alcohol	2500	U
95-50-1	1,2-Dichlorobenzene	2500	U
95-48-7	2-Methylphenol	2500	U
108-60-1	bis(2-Chloroisopropyl)Ether	2500	U
106-44-5	4-Methylphenol	2500	U
621-64-7	N-Nitroso-Di-n-Propylamine	2500	U
67-72-1	Hexachloroethane	2500	U
98-95-3	Nitrobenzene	2500	U
78-59-1	Isophorone	2500	U
88-75-5	2-Nitrophenol	2500	U
105-67-9	2,4-Dimethylphenol	2500	U
65-85-0	Benzoic Acid	13000	U
111-91-1	bis(2-Chloroethoxy)Methane	2500	U
120-83-2	2,4-Dichlorophenol	2500	U
120-82-1	1,2,4-Trichlorobenzene	2500	U
91-20-3	Naphthalene	2500	U
106-47-8	4-Chloroaniline	2500	U
87-68-3	Hexachlorobutadiene	2500	U
59-50-7	4-Chloro-3-Methylphenol	2500	U
91-57-6	2-Methylnaphthalene	2500	U
77-47-4	Hexachlorocyclopentadiene	2500	U
88-06-2	2,4,6-Trichlorophenol	2500	U
95-95-4	2,4,5-Trichlorophenol	13000	U
91-58-7	2-Chloronaphthalene	2500	U
88-74-4	2-Nitroaniline	13000	U
131-11-3	Dimethyl Phthalate	2500	U
208-96-8	Acenaphthylene	2500	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT411DL

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT411DL

Sample wt/vol: 800 (g/mL) ML Lab File ID: 3110E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 09/01/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 200

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	13000	U
83-32-9	Acenaphthene	2500	U
51-28-5	2,4-Dinitrophenol	13000	U
100-02-7	4-Nitrophenol	13000	U
132-64-9	Dibenzofuran	2500	U
121-14-2	2,4-Dinitrotoluene	2500	U
606-20-2	2,6-Dinitrotoluene	2500	U
84-66-2	Diethylphthalate	2500	U
7005-72-3	4-Chlorophenyl-phenylether	2500	U
86-73-7	Fluorene	2500	U
100-01-6	4-Nitroaniline	13000	U
534-52-1	4,6-Dinitro-2-Methylphenol	13000	U
86-30-6	N-Nitrosodiphenylamine (1)	2500	U
101-55-3	4-Bromophenyl-phenylether	2500	U
118-74-1	Hexachlorobenzene	2500	U
87-86-5	Pentachlorophenol	13000	U
85-01-8	Phenanthrene	2500	U
120-12-7	Anthracene	2500	U
84-74-2	Di-n-Butylphthalate	2500	U
206-44-0	Fluoranthene	2500	U
129-00-0	Pyrene	2500	U
85-68-7	Butylbenzylphthalate	2500	U
91-94-1	3,3'-Dichlorobenzidine	5000	U
56-55-3	Benzo(a)Anthracene	2500	U
117-81-7	bis(2-Ethylhexyl)Phthalate	2500	U
218-01-9	Chrysene	2500	U
117-84-0	Di-n-Octyl Phthalate	2500	U
205-99-2	Benzo(b)Fluoranthene	2500	U
207-08-9	Benzo(k)Fluoranthene	2500	U
50-32-8	Benzo(a)Pyrene	2500	U
193-39-5	Indeno(1,2,3-cd)Pyrene	2500	U
53-70-3	Dibenz(a,h)Anthracene	2500	U
191-24-2	Benzo(g,h,i)Perylene	2500	U

(1) - Cannot be separated from Diphenylamine

1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT421

a Name: RECRA ENVIRON Contract: 68-W8-0047

ab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

a rix: (soil/water) WATER Lab Sample ID: BT421

ample wt/vol: 1000 (g/mL) ML Lab File ID: 2819E

e.el: (low/med) LOW Date Received: 08/04/88

oisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

xtraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/18/88

? Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	UJ
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	UJ
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	U
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT421

b Name: RECRA ENVIRON Contract: 68-W8-0047

b Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

trix: (soil/water) WATER Lab Sample ID: BT421

mple wt/vol: 1000 (g/mL) ML Lab File ID: 2819E

vel: (low/med) LOW Date Received: 08/04/88

loisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

traction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/18/88

Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	UJ
100-02-7	4-Nitrophenol	50	UJ
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	UJ
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	2	BJ
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	UJ
91-94-1	3,3'-Dichlorobenzidine	20	UJ
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	UJ
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT421

Lab Name: RECRA ENVIRON   Contract: 68-W8-0047

Lab Code: RECNY   Case No.: 10155   SAS No.: ____   SDG No.: BT411

Matrix: (soil/water) WATER   Lab Sample ID: BT421

Sample wt/vol: 1000 (g/mL) ML   Lab File ID: 2819E

Level: (low/med) LOW   Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____   Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF   Date Analyzed: 08/18/88

GPC Cleanup: (Y/N) N   pH: 7.0   Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-07-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	2	BJ
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO. 1533

BT421

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT421

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2819E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/18/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CONCENTRATION UNITS:
Number TIC's found: 1 (ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN ALCOHOL	19:05	39	B
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1B
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT422

Name: RECRA ENVIRON Contract: 68-W8-0047

Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

rix: (soil/water) WATER Lab Sample ID: BT422

le wt/vol: 1000 (g/mL) ML Lab File ID: 2828E

l: (low/med) LOW Date Received: 08/04/88

oisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

action: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/19/88

Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
108-95-2	Phenol	10	U
111-44-4	bis(2-Chloroethyl)Ether	10	U
95-57-8	2-Chlorophenol	10	U
541-73-1	1,3-Dichlorobenzene	10	U
106-46-7	1,4-Dichlorobenzene	10	U
100-51-6	Benzyl Alcohol	10	U
95-50-1	1,2-Dichlorobenzene	10	U
95-48-7	2-Methylphenol	10	U
108-60-1	bis(2-Chloroisopropyl)Ether	10	U
106-44-5	4-Methylphenol	10	U
621-64-7	N-Nitroso-Di-n-Propylamine	10	U
67-72-1	Hexachloroethane	10	U
98-95-3	Nitrobenzene	10	U
78-59-1	Isophorone	10	U
88-75-5	2-Nitrophenol	10	U
105-67-9	2,4-Dimethylphenol	10	U
65-85-0	Benzoic Acid	50	U
111-91-1	bis(2-Chloroethoxy)Methane	10	U
120-83-2	2,4-Dichlorophenol	10	U
120-82-1	1,2,4-Trichlorobenzene	10	U
91-20-3	Naphthalene	10	U
106-47-8	4-Chloroaniline	10	U
87-68-3	Hexachlorobutadiene	10	U
59-50-7	4-Chloro-3-Methylphenol	10	U
91-57-6	2-Methylnaphthalene	10	U
77-47-4	Hexachlorocyclopentadiene	10	UJ
88-06-2	2,4,6-Trichlorophenol	10	U
95-95-4	2,4,5-Trichlorophenol	50	U
91-58-7	2-Chloronaphthalene	10	U
88-74-4	2-Nitroaniline	50	U
131-11-3	Dimethyl Phthalate	10	U
208-96-8	Acenaphthylene	10	U

1C
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT422

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT422

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2828E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/19/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L

CAS NO.	COMPOUND		Q
99-09-2	3-Nitroaniline	50	UJ
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	UJ
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-01-6	4-Nitroaniline	50	UJ
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	UJ
91-94-1	3,3'-Dichlorobenzidine	20	UJ
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1C

SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT422

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT422

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2828E

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ dec. ____ Date Extracted: 08/05/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 08/19/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
99-09-2	3-Nitroaniline	50	U
83-32-9	Acenaphthene	10	U
51-28-5	2,4-Dinitrophenol	50	U
100-02-7	4-Nitrophenol	50	U
132-64-9	Dibenzofuran	10	U
121-14-2	2,4-Dinitrotoluene	10	U
606-20-2	2,6-Dinitrotoluene	10	U
84-66-2	Diethylphthalate	10	U
7005-72-3	4-Chlorophenyl-phenylether	10	U
86-73-7	Fluorene	10	U
100-07-6	4-Nitroaniline	50	U
534-52-1	4,6-Dinitro-2-Methylphenol	50	U
86-30-6	N-Nitrosodiphenylamine (1)	10	U
101-55-3	4-Bromophenyl-phenylether	10	U
118-74-1	Hexachlorobenzene	10	U
87-86-5	Pentachlorophenol	50	U
85-01-8	Phenanthrene	10	U
120-12-7	Anthracene	10	U
84-74-2	Di-n-Butylphthalate	10	U
206-44-0	Fluoranthene	10	U
129-00-0	Pyrene	10	U
85-68-7	Butylbenzylphthalate	10	U
91-94-1	3,3'-Dichlorobenzidine	20	U
56-55-3	Benzo(a)Anthracene	10	U
117-81-7	bis(2-Ethylhexyl)Phthalate	10	U
218-01-9	Chrysene	10	U
117-84-0	Di-n-Octyl Phthalate	10	U
205-99-2	Benzo(b)Fluoranthene	10	U
207-08-9	Benzo(k)Fluoranthene	10	U
50-32-8	Benzo(a)Pyrene	10	U
193-39-5	Indeno(1,2,3-cd)Pyrene	10	U
53-70-3	Dibenz(a,h)Anthracene	10	U
191-24-2	Benzo(g,h,i)Perylene	10	U

(1) - Cannot be separated from Diphenylamine

1F
SEMIVOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BT422

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT422

Sample wt/vol: 1000 (g/mL) ML Lab File ID: 2828E

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/19/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1.00

Number TIC's found: 5

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	19:06	80	B
2. -	UNKNOWN	19:18	16	
3. -	UNKNOWN	24:30	24	
4. -	UNKNOWN	28:53	26	
5. -	UNKNOWN	33:36	10	
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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.: BT415

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: SW1816

Sample wt/vol: 1000 (g/mL) ML Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/13/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1

CAS NO.	COMPO ND	CONCENTRATION NITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.05	U
319-85-7	beta-BHC	0.05	U
319-86-8	delta-BHC	0.05	U
58-89-9	gamma-BHC (Lindane)	0.05	U
76-44-8	Heptachlor	0.05	U
309-00-2	Aldrin	0.05	U
1024-57-3	Heptachlor epoxide	0.05	U
959-98-8	Endosulfan I	0.05	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.5	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.5	U
5103-74-2	gamma-Chlordane	0.5	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.5	U
11104-28-2	Aroclor-1221	0.5	U
11141-16-5	Aroclor-1232	0.5	U
53469-21-9	Aroclor-1242	0.5	U
12672-29-6	Aroclor-1248	0.5	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

FORM I PEST

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.

BT412

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: SS1148

Sample wt/vol: 30.06 (g/mL) G Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. 24 dec. - Date Extracted: 8/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 8/30/88

GPC Cleanup: (Y/N) Y pH: 6.6 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	21	U
319-85-7	beta-BHC	21	U
319-86-8	delta-BHC	22	
58-89-9	gamma-BHC (Lindane)	21	U
76-44-8	Heptachlor	60	U
309-00-2	Aldrin	21	U
1024-57-3	Heptachlor epoxide	21	U
959-98-8	Endosulfan I	170	U
60-57-1	Dieldrin	42	U
72-55-9	4,4'-DDE	42	U
72-20-8	Endrin	130	U
33213-65-9	Endosulfan II	42	U
72-54-8	4,4'-DDD	260	U
1031-07-8	Endosulfan sulfate	42	U
50-29-3	4,4'-DDT	86	U
72-43-5	Methoxychlor	210	U
53494-70-5	Endrin ketone	42	U
5103-71-9	alpha-Chlordane	210	U
5103-74-2	gamma-Chlordane	210	U
8001-35-2	Toxaphene	420	U
12674-11-2	Aroclor-1016	210	U
11104-28-2	Aroclor-1221	210	U
11141-16-5	Aroclor-1232	210	U
53469-21-9	Aroclor-1242	210	U
12672-29-6	Aroclor-1248	210	U
11097-69-1	Aroclor-1254	420	U
11096-82-5	Aroclor-1260	420	U

FORM I PEST

1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.: BT416

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: SW1819

Sample wt/vol: 1000 (g/mL) ML Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/13/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1

CAS NO.	COMPO ND	CONCENTRATION NITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.05	U
319-85-7	beta-BHC	0.05	U
319-86-8	delta-BHC	0.05	U
58-89-9	gamma-BHC (Lindane)	0.05	U
76-44-8	Heptachlor	0.05	U
309-00-2	Aldrin	0.05	U
1024-57-3	Heptachlor epoxide	0.05	U
959-98-8	Endosulfan I	0.05	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.5	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.5	U
5103-74-2	gamma-Chlordane	0.5	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.5	U
11104-28-2	Aroclor-1221	0.5	U
11141-16-5	Aroclor-1232	0.5	U
53469-21-9	Aroclor-1242	0.5	U
12672-29-6	Aroclor-1248	0.5	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

FORM I PEST

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.: BT413

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: SS1151

Sample wt/vol: 30.16 (g/mL) G Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. 22 dec. - Date Extracted: 8/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 8/30/88

GPC Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	21	U
319-85-7	beta-BHC	21	U
319-86-8	delta-BHC	21	U
58-89-9	gamma-BHC (Lindane)	21	U
76-44-8	Heptachlor	21	U
309-00-2	Aldrin	21	U
1024-57-3	Heptachlor epoxide	21	U
959-98-8	Endosulfan I	21	U
60-57-1	Dieldrin	42	U
72-55-9	4,4'-DDE	42	U
72-20-8	Endrin	42	U
33213-65-9	Endosulfan II	42	U
72-54-8	4,4'-DDD	250	U
1031-07-8	Endosulfan sulfate	42	U
50-29-3	4,4'-DDT	410	
72-43-5	Methoxychlor	210	U
53494-70-5	Endrin ketone	42	U
5103-71-9	alpha-Chlordane	210	U
5103-74-2	gamma-Chlordane	130	J
8001-35-2	Toxaphene	420	U
12674-11-2	Aroclor-1016	210	U
11104-28-2	Aroclor-1221	210	U
11141-16-5	Aroclor-1232	210	U
53469-21-9	Aroclor-1242	210	U
12672-29-6	Aroclor-1248	210	U
11097-69-1	Aroclor-1254	420	U
11096-82-5	Aroclor-1260	420	U

FORM I PEST

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO. BT417

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: SW1820

Sample wt/vol: 1000 (g/mL) ML Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/13/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1

CAS NO.	COMPO ND	CONCENTRATION NITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.05	U
319-85-7	beta-BHC	0.05	U
319-86-8	delta-BHC	0.05	U
58-89-9	gamma-BHC (Lindane)	0.05	U
76-44-8	Heptachlor	0.05	U
309-00-2	Aldrin	0.05	U
1024-57-3	Heptachlor epoxide	0.05	U
959-98-8	Endosulfan I	0.05	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.5	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.5	U
5103-74-2	gamma-Chlordane	0.5	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.5	U
11104-28-2	Aroclor-1221	0.5	U
11141-16-5	Aroclor-1232	0.5	U
53469-21-9	Aroclor-1242	0.5	U
12672-29-6	Aroclor-1248	0.5	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.: BT414

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: SS1152

Sample wt/vol: 30.36(g/mL) G Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. 22 dec. - Date Extracted: 8/13/88

Extraction: (SepF/Cont/Sonc) SONC Date Analyzed: 8/30/88

GPC Cleanup: (Y/N) Y pH: 6.9 Dilution Factor: 1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
319-84-6	alpha-BHC	21	U
319-85-7	beta-BHC	21	U
319-86-8	delta-BHC	21	U
58-89-9	gamma-BHC (Lindane)	21	U
76-44-8	Heptachlor	21	U
309-00-2	Aldrin	21	U
1024-57-3	Heptachlor epoxide	21	U
959-98-8	Endosulfan I	15	J
60-57-1	Dieldrin	42	U
72-55-9	4,4'-DDE	42	U
72-20-8	Endrin	42	U
33213-65-9	Endosulfan II	42	U
72-54-8	4,4'-DDD	170	
1031-07-8	Endosulfan sulfate	42	U
50-29-3	4,4'-DDT	150	U
72-43-5	Methoxychlor	210	U
53494-70-5	Endrin ketone	42	U
5103-71-9	alpha-Chlordane	210	U
5103-74-2	gamma-Chlordane	26	
8001-35-2	Toxaphene	420	U
12674-11-2	Aroclor-1016	210	U
11104-28-2	Aroclor-1221	210	U
11141-16-5	Aroclor-1232	210	U
53469-21-9	Aroclor-1242	210	U
12672-29-6	Aroclor-1248	210	U
11097-69-1	Aroclor-1254	420	U
11096-82-5	Aroclor-1260	420	U

FORM I PEST

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1D
PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.: BT418

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: SW1821

Sample wt/vol: 1000 (g/mL) ML Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/13/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1

CAS NO.	COMPO ND	CONCENTRATION NITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.05	U
319-85-7	beta-BHC	0.05	U
319-86-8	delta-BHC	0.05	U
58-89-9	gamma-BHC (Lindane)	0.05	U
76-44-8	Heptachlor	0.05	U
309-00-2	Aldrin	0.05	U
1024-57-3	Heptachlor epoxide	0.05	U
959-98-8	Endosulfan I	0.05	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.5	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.5	U
5103-74-2	gamma-Chlordane	0.5	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.5	U
11104-28-2	Aroclor-1221	0.5	U
11141-16-5	Aroclor-1232	0.5	U
53469-21-9	Aroclor-1242	0.5	U
12672-29-6	Aroclor-1248	0.5	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

1D

PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO. BT419

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: SW1822

Sample wt/vol: 1000 (g/mL) ML Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/12/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1

CAS NO.	COMPO ND	CONCENTRATION NITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.05	U
319-85-7	beta-BHC	0.05	U
319-86-8	delta-BHC	0.05	U
58-89-9	gamma-BHC (Lindane)	0.05	U
76-44-8	Heptachlor	0.05	U
309-00-2	Aldrin	0.05	U
1024-57-3	Heptachlor epoxide	0.05	U
959-98-8	Endosulfan I	0.05	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.5	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.5	U
5103-74-2	gamma-Chlordane	0.5	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.5	U
11104-28-2	Aroclor-1221	0.5	U
11141-16-5	Aroclor-1232	0.5	U
53469-21-9	Aroclor-1242	0.5	U
12672-29-6	Aroclor-1248	0.5	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

FORM I PEST

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO. BT411

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: SW1813

Sample wt/vol: 740 (g/mL) ML Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/13/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 0.1

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.68	U
319-85-7	beta-BHC	0.68	U
319-86-8	delta-BHC	0.27	J
58-89-9	gamma-BHC (Lindane)	0.68	U
76-44-8	Heptachlor	0.68	U
309-00-2	Aldrin	0.68	U
1024-57-3	Heptachlor epoxide	0.68	U
959-98-8	Endosulfan I	0.68	U
60-57-1	Dieldrin	1.4	U
72-55-9	4,4'-DDE	1.4	U
72-20-8	Endrin	1.4	U
33213-65-9	Endosulfan II	1.4	U
72-54-8	4,4'-DDD	1.4	U
1031-07-8	Endosulfan sulfate	1.4	U
50-29-3	4,4'-DDT	1.4	U
72-43-5	Methoxychlor	6.8	U
53494-70-5	Endrin ketone	1.4	U
5103-71-9	alpha-Chlordane	6.8	U
5103-74-2	gamma-Chlordane	6.8	U
8001-35-2	Toxaphene	14	U
12674-11-2	Aroclor-1016	6.8	U
11104-28-2	Aroclor-1221	6.8	U
11141-16-5	Aroclor-1232	6.8	U
53469-21-9	Aroclor-1242	6.8	U
12672-29-6	Aroclor-1248	6.8	U
11097-69-1	Aroclor-1254	14	U
11096-82-5	Aroclor-1260	14	U

FORM I PEST

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO.: BT421

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: SW1823

Sample wt/vol: 1000 (g/mL) ML Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/12/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1

CAS NO.	COMPO ND	CONCENTRATION NITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.05	U
319-85-7	beta-BHC	0.05	U
319-86-8	delta-BHC	0.05	U
58-89-9	gamma-BHC (Lindane)	0.05	U
76-44-8	Heptachlor	0.05	U
309-00-2	Aldrin	0.05	U
1024-57-3	Heptachlor epoxide	0.05	U
959-98-8	Endosulfan I	0.05	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.5	U
53494-70-5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.5	U
5103-74-2	gamma-Chlordane	0.5	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.5	U
11104-28-2	Aroclor-1221	0.5	U
11141-16-5	Aroclor-1232	0.5	U
53469-21-9	Aroclor-1242	0.5	U
12672-29-6	Aroclor-1248	0.5	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

FORM I PEST

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PESTICIDE ORGANICS ANALYSIS DATA SHEET

SAMPLE NO. BT422

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: NA SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: SW1824

Sample wt/vol: 1000 (g/mL) ML Lab File ID: -

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - dec. - Date Extracted: 8/5/88

Extraction: (SepF/Cont/Sonc) SEPF Date Analyzed: 8/12/88

GPC Cleanup: (Y/N) N pH: 7.0 Dilution Factor: 1

CAS NO.	COMPO ND	CONCENTRATION NITS: (ug/L or ug/Kg) UG/L	Q
319-84-6	alpha-BHC	0.05	U
319-85-7	beta-BHC	0.05	U
319-86-8	delta-BHC	0.05	U
58-89-9	gamma-BHC (Lindane)	0.05	U
76-44-8	Heptachlor	0.05	U
309-00-2	Aldrin	0.05	U
1024-57-3	Heptachlor epoxide	0.05	U
959-98-8	Endosulfan I	0.05	U
60-57-1	Dieldrin	0.10	U
72-55-9	4,4'-DDE	0.10	U
72-20-8	Endrin	0.10	U
33213-65-9	Endosulfan II	0.10	U
72-54-8	4,4'-DDD	0.10	U
1031-07-8	Endosulfan sulfate	0.10	U
50-29-3	4,4'-DDT	0.10	U
72-43-5	Methoxychlor	0.5	U
53494-70.5	Endrin ketone	0.10	U
5103-71-9	alpha-Chlordane	0.5	U
5103-74-2	gamma-Chlordane	0.5	U
8001-35-2	Toxaphene	1.0	U
12674-11-2	Aroclor-1016	0.5	U
11104-28-2	Aroclor-1221	0.5	U
11141-16-5	Aroclor-1232	0.5	U
53469-21-9	Aroclor-1242	0.5	U
12672-29-6	Aroclor-1248	0.5	U
11097-69-1	Aroclor-1254	1.0	U
11096-82-5	Aroclor-1260	1.0	U

FORM I PEST

184

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT412

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT412

Sample wt/vol: 4.1 (g/mL) G Lab File ID: 27164HP

Level: (low/med) MED Date Received: 08/04/88

% Moisture: not dec. 24 Date Analyzed: 08/12/88

Column: (pack/cap) PACK Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	20000 16000	UJ
74-83-9	Bromomethane	16000	U
75-01-4	Vinyl Chloride	16000	U
75-00-3	Chloroethane	16000	U
75-09-2	Methylene Chloride	10000 8000	U
67-64-1	Acetone	20000 16000	U
75-15-0	Carbon Disulfide	10000 8000	U
75-35-4	1,1-Dichloroethene	8000	U
75-34-3	1,1-Dichloroethane	8000	U
540-59-0	1,2-Dichloroethene (total)	8000	U
67-66-3	Chloroform	8000	U
107-06-2	1,2-Dichloroethane	8000	U
78-93-3	2-Butanone	20000 16000	U
71-55-6	1,1,1-Trichloroethane	10000 8000	U
56-23-5	Carbon Tetrachloride	8000	U
108-05-4	Vinyl Acetate	20000 16000	U
75-27-4	Bromodichloromethane	10000 8000	U
78-87-5	1,2-Dichloropropane	8000	U
10061-01-5	Trans-1,3-Dichloropropene	8000	U
79-01-6	Trichloroethene	8000	U
124-48-1	Dibromochloromethane	8000	U
79-00-5	1,1,2-Trichloroethane	8000	UJ
71-43-2	Benzene	10000 ~~250~~	~~BJ~~ UJ
10061-02-6	cis-1,3-Dichloropropene	8000	UJ
75-25-2	Bromoform	8000	U
591-78-6	2-Hexanone	20000 16000	U
108-10-1	4-Methyl-2-Pentanone	16000	U
127-18-4	Tetrachloroethene	10000 8000	U
79-34-5	1,1,2,2-Tetrachloroethane	8000	UJ
108-88-3	Toluene	10000 ~~1200~~	~~BJ~~ UJ
108-90-7	Chlorobenzene	10000 ~~2100~~	~~J~~ UJ
100-41-4	Ethylbenzene	10000 8000	UJ
100-42-5	Styrene	8000	U
1330-20-7	Total Xylenes	8000	UJ

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

184

BT412

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT412

Sample wt/vol: 4.1 (g/mL) G Lab File ID: 27164HP

Level: (low/med) MED Date Received: 08/04/88

% Moisture: not dec. 24 Date Analyzed: 08/12/88

Column: (pack/cap) PACK Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	16000	U
74-83-9	Bromomethane	16000	U
75-01-4	Vinyl Chloride	16000	U
75-00-3	Chloroethane	16000	U
75-09-2	Methylene Chloride	8000	U
67-64-1	Acetone	16000	U
75-15-0	Carbon Disulfide	8000	U
75-35-4	1,1-Dichloroethene	8000	U
75-34-3	1,1-Dichloroethane	8000	U
540-59-0	1,2-Dichloroethene (total)	8000	U
67-66-3	Chloroform	8000	U
107-06-2	1,2-Dichloroethane	8000	U
78-93-3	2-Butanone	16000	U
71-55-6	1,1,1-Trichloroethane	8000	U
56-23-5	Carbon Tetrachloride	8000	U
108-05-4	Vinyl Acetate	16000	U
75-27-4	Bromodichloromethane	8000	U
78-87-5	1,2-Dichloropropane	8000	U
10061-01-5	Trans-1,3-Dichloropropene	8000	U
79-01-6	Trichloroethene	8000	U
124-48-1	Dibromochloromethane	8000	U
79-00-5	1,1,2-Trichloroethane	8000	U
71-43-2	Benzene	250	BJ
10061-02-6	cis-1,3-Dichloropropene	8000	U
75-25-2	Bromoform	8000	U
591-78-6	2-Hexanone	16000	U
108-10-1	4-Methyl-2-Pentanone	16000	U
127-18-4	Tetrachloroethene	8000	U
79-34-5	1,1,2,2-Tetrachloroethane	16000	U
108-88-3	Toluene	1200	BJ
108-90-7	Chlorobenzene	2100	J
100-41-4	Ethylbenzene	8000	U
100-42-5	Styrene	8000	U
1330-20-7	Total Xylenes	8000	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BT412

185

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT412

Sample wt/vol: 4.1 (g/mL) G Lab File ID: 27164HP

Level: (low/med) MED Date Received: 8/4/88

% Moisture: not dec. 24 Date Analyzed: 8/12/88

Column: (pack/cap) PACK Dilution Factor: 10.0

Number TICs found: 9

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	01:28	66,000	B
2. -	UNKNOWN	06:48	540,000	B
3. -	UNKNOWN	25:04	54,000	
4. -	ISOMER OF ETHYL METHYL-CYCLOHEXANE	26:25	14,000	
5. -	UNKNOWN	27:50	180,000	
6. -	POSSIBLY SUBSTITUTED CYCLOHEXANE	29:11	120,000	
7. -	UNKNOWN	29:57	24,000	
8. -	SUBSTITUTED HYDROCARBON	31:01	230,000	
9. -	SUBSTITUTED HYDROCARBON	31:59	20,000	
10.				
11.				
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FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT416

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT416

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6504

Level: (low/med) LOW Date Received: 08/04/88

% Moisture: not dec. ____ Date Analyzed: 08/05/88

Column: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	UJ
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	UJ
75-09-2	Methylene Chloride	6	~~B~~ U
67-64-1	Acetone	10 ~~0.4~~	~~J~~ U
75-15-0	Carbon Disulfide	10	~~B~~ UJ
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5 ~~0.4~~	~~J~~ U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	UR
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	UJ
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	Trans-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	UJ
71-43-2	Benzene	5 ~~0.1~~	~~J~~ U
10061-02-6	cis-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	UJ
591-78-6	-Hexanone	10	U
108-10-1	-Methyl-2-Pentanone	10	U
127-18-4	trachloroethene	0.9	J
79-34-5	1,2,2-Tetrachloroethane	5	U
108-88-3	luene	5 ~~0.3~~	~~BJ~~ U
108-90-7	lorobenzene	5 ~~0.1~~	~~J~~ U
100-41-4	ylbenzene	5	U
100-42-5	rene	5	U
1330-20-7	al Xylenes	5	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BT416

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT416

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6504

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - Date Analyzed: 8/5/88

Column: (pack/cap) PACK Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1. -	UNKNOWN	2:16	12	B
2. -	UNKNOWN	5:42	28	B
3.				
4.				
5.				
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FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT413

ɔ Name: RECRA ENVIRON Contract: 68-W8-0047

ab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

:rix: (soil/water) SOIL Lab Sample ID: BT413

ample wt/vol: 4.0 (g/mL) G Lab File ID: 27168HP

evel: (low/med) MED Date Received: 08/04/88

oisture: not dec. 22 Date Analyzed: 08/12/88

lumn: (pack/cap) PACK Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	20000 ~~16000~~	U
74-83-9	Bromomethane	16000	U
75-01-4	Vinyl Chloride	16000	U
75-00-3	Chloroethane	16000	U
75-09-2	Methylene Chloride	10000 8000	U
67-64-1	Acetone	20000 16000	U
75-15-0	Carbon Disulfide	10000 8000	U
75-35-4	1,1-Dichloroethene	8000	U
75-34-3	1,1-Dichloroethane	8000	U
540-59-0	1,2-Dichloroethene (total)	8000	U
67-66-3	Chloroform	8000	U
107-06-2	1,2-Dichloroethane	8000	U
78-93-3	2-Butanone	20000 16000	U
71-55-6	1,1,1-Trichloroethane	10000 8000	U
56-23-5	Carbon Tetrachloride	8000	U
108-05-4	Vinyl Acetate	20000 16000	U
75-27-4	Bromodichloromethane	10000 8000	U
78-87-5	1,2-Dichloropropane	8000	U
10061-01-5	Trans-1,3-Dichloropropene	8000	U
79-01-6	Trichloroethene	8000	U
124-48-1	Dibromochloromethane	8000	U
79-00-5	1,1,2-Trichloroethane	8000	U
71-43-2	Benzene	8000	U
10061-02-6	cis-1,3-Dichloropropene	8000	U
75-25-2	Bromoform	8000	U
591-78-6	2-Hexanone	20000 16000	U
108-10-1	4-Methyl-2-Pentanone	16000	U
127-18-4	Tetrachloroethene	10000 8000	U
79-34-5	1,1,2,2-Tetrachloroethane	8000	U
108-.8-3	Toluene	8000	U
108- 0-7	Chlorobenzene	8000	U
100- 1-4	Ethylbenzene	8000	U
100- 2-5	Styrene	8000	U
1330 20-7	Total Xylenes	8000	UJ

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.
236

BT413

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT413

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 27168HP

Level: (low/med) MED Date Received: 08/04/88

% Moisture: not dec. 22 Date Analyzed: 08/12/88

Column: (pack/cap) PACK Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	16000	U
74-83-9	Bromomethane	16000	U
75-01-4	Vinyl Chloride	16000	U
75-00-3	Chloroethane	16000	U
75-09-2	Methylene Chloride	8000	U
67-64-1	Acetone	16000	U
75-15-0	Carbon Disulfide	8000	U
75-35-4	1,1-Dichloroethene	8000	U
75-34-3	1,1-Dichloroethane	8000	U
540-59-0	1,2-Dichloroethene (total)	8000	U
67-66-3	Chloroform	8000	U
107-06-2	1,2-Dichloroethane	8000	U
78-93-3	2-Butanone	16000	U
71-55-6	1,1,1-Trichloroethane	8000	U
56-23-5	Carbon Tetrachloride	8000	U
108-05-4	Vinyl Acetate	16000	U
75-27-4	Bromodichloromethane	8000	U
78-87-5	1,2-Dichloropropane	8000	U
10061-01-5	Trans-1,3-Dichloropropene	8000	U
79-01-6	Trichloroethene	8000	U
124-48-1	Dibromochloromethane	8000	U
79-00-5	1,1,2-Trichloroethane	8000	U
71-43-2	Benzene	8000	U
10061-02-6	cis-1,3-Dichloropropene	8000	U
75-25-2	Bromoform	8000	U
591-78-6	2-Hexanone	16000	U
108-10-1	4-Methyl-2-Pentanone	16000	U
127-18-4	Tetrachloroethene	8000	U
79-34-5	1,1,2,2-Tetrachloroethane	16000	U
108-88-3	Toluene	8000	U
108-90-7	Chlorobenzene	8000	U
100-41-4	Ethylbenzene	8000	U
100-42-5	Styrene	8000	U
1330-20-7	Total Xylenes	8000	U

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.
BT413

1237

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT413

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 27168HP

Level: (low/med) MED Date Received: 8/4/88

% Moisture: not dec. 22 Date Analyzed: 8/12/88

Column: (pack/cap) PACK Dilution Factor: 10.0

Number TICs found: 6

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/KG

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	-	UNKNOWN	03:16	640,000	
2.	-	UNKNOWN	06:48	350,000	B
3.	1112-39-6	DIMETHOXYDIMETHYL-SILANE	16:33	16,000	
4.	-	SUBSTITUTED HYDROCARBON	25:30	89,000	
5.	-	SUBSTITUTED SILOXANE COMPOUND	27:52	44,000	
6.	-	ALKYL HYDROCARBON	29:29	25,000	
7.					
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FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO. 378

BT417

.b Name: RECRA ENVIRON Contract: 68-W8-0047

.l Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

.trix: (soil/water) WATER Lab Sample ID: BT417

.ple wt/vol: 5.0 (g/mL) ML Lab File ID: 6529

.l: (low/med) LOW Date Received: 08/04/88

Moisture: not dec. ____ Date Analyzed: 08/10/88

.l mn: (pack/cap) PACK Dilution Factor: 1.00

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/L	Q
74-87-3	Chloromethane	10	UJ
74-83-9	Bromomethane	10	U
75-01-4	Vinyl Chloride	10	U
75-00-3	Chloroethane	10	UJ
75-09-2	Methylene Chloride	19	~~B~~ U
67-64-1	Acetone	21	UJ
75-15-0	Carbon Disulfide	5 ~~2~~	~~BJ~~ UJ
75-35-4	1,1-Dichloroethene	5	U
75-34-3	1,1-Dichloroethane	5	U
540-59-0	1,2-Dichloroethene (total)	5	U
67-66-3	Chloroform	5 ~~0.09~~	~~BJ~~ U
107-06-2	1,2-Dichloroethane	5	U
78-93-3	2-Butanone	10	UR
71-55-6	1,1,1-Trichloroethane	5	U
56-23-5	Carbon Tetrachloride	5	U
108-05-4	Vinyl Acetate	10	U
75-27-4	Bromodichloromethane	5	U
78-87-5	1,2-Dichloropropane	5	U
10061-01-5	Trans-1,3-Dichloropropene	5	U
79-01-6	Trichloroethene	5	U
124-48-1	Dibromochloromethane	5	U
79-00-5	1,1,2-Trichloroethane	5	U
71-43-2	Benzene	5 ~~0.08~~	~~BJ~~ U
10061-02-6	cis-1,3-Dichloropropene	5	U
75-25-2	Bromoform	5	U
591-78-6	2-Hexanone	10	U
108-10-1	4-Methyl-2-Pentanone	10	U
127-18-4	Tetrachloroethene	0.1	J
79-34-5	1,1,2,2-Tetrachloroethane	5	U
108-88-3	Toluene	5 ~~0.1~~	~~BJ~~ U
108-90-7	C lorobenzene	5	U
100-41-4	E ylbenzene	5	U
100-42-5	S rene	5	U
1330-20-7	T l Xylenes	5	UJ

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VOLATILE ORGANICS ANALYSIS DATA SHEET
TENTATIVELY IDENTIFIED COMPOUNDS

EPA SAMPLE NO.

BT417

379

Lab Name: RECRA ENVIRONMENTAL, INC. Contract: 68-W8-0047

Lab Code: RECNY CASE NO.: 10155 SAS No.: - SDG No.: BT411

Matrix: (soil/water) WATER Lab Sample ID: BT417

Sample wt/vol: 5.0 (g/mL) ML Lab File ID: 6529

Level: (low/med) LOW Date Received: 8/4/88

% Moisture: not dec. - Date Analyzed: 8/10/88

Column: (pack/cap) PACK Dilution Factor: 1.00

Number TICs found: 2

CONCENTRATION UNITS:
(ug/L or ug/Kg) UG/L

	CAS NUMBER	COMPOUND NAME	RT	EST. CONC.	Q
1.	-	UNKNOWN	2:22	11	B
2.	-	UNKNOWN	5:20	49	B
3.					
4.					
5.					
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FORM I VOA-TIC

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VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT414

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT414

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 27169HP

Level: (low/med) MED Date Received: 08/04/88

% Moisture: not dec. 22 Date Analyzed: 08/12/88

Column: (pack/cap) PACK Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	20000 16000	U J
74-83-9	Bromomethane	16000	U
75-01-4	Vinyl Chloride	16000	U
75-00-3	Chloroethane	16000	U
75-09-2	Methylene Chloride	28000	~~B~~ UJ
67-64-1	Acetone	20000 16000	U
75-15-0	Carbon Disulfide	10000 8000	U
75-35-4	1,1-Dichloroethene	8000	U
75-34-3	1,1-Dichloroethane	8000	U
540-59-0	1,2-Dichloroethene (total)	8000	U
67-66-3	Chloroform	8000	U
107-06-2	1,2-Dichloroethane	8000	U
78-93-3	2-Butanone	20000 16000	UR
71-55-6	1,1,1-Trichloroethane	10000 8000	U
56-23-5	Carbon Tetrachloride	8000	U
108-05-4	Vinyl Acetate	20000 16000	U
75-27-4	Bromodichloromethane	10000 8000	U
78-87-5	1,2-Dichloropropane	8000	U
10061-01-5	Trans-1,3-Dichloropropene	8000	U
79-01-6	Trichloroethene	8000	U
124-48-1	Dibromochloromethane	8000	U
79-00-5	1,1,2-Trichloroethane	8000	U
71-43-2	Benzene	8000	U
10061-02-6	cis-1,3-Dichloropropene	8000	U
75-25-2	Bromoform	8000	U
591-78-6	2-Hexanone	20000 16000	U
108-10-1	4-Methyl-2-Pentanone	16000	U
127-18-4	Tetrachloroethene	10000 8000	U
79-34-5	1,1,2,2-Tetrachloroethane	8000	U
108-88-3	Toluene	8000	U
108-90-7	Chlorobenzene	8000	U
100-41-4	Ethylbenzene	8000	U
100-42-5	Styrene	8000	U
1330-20-7	Total Xylenes	8000	U J

FORM I VOA 1/87 Rev.

1A
VOLATILE ORGANICS ANALYSIS DATA SHEET

EPA SAMPLE NO.

BT414

Lab Name: RECRA ENVIRON Contract: 68-W8-0047

Lab Code: RECNY Case No.: 10155 SAS No.: ______ SDG No.: BT411

Matrix: (soil/water) SOIL Lab Sample ID: BT414

Sample wt/vol: 4.0 (g/mL) G Lab File ID: 27169HP

Level: (low/med) MED Date Received: 08/04/88

% Moisture: not dec. 22 Date Analyzed: 08/12/88

Column: (pack/cap) PACK Dilution Factor: 10.0

CAS NO.	COMPOUND	CONCENTRATION UNITS: (ug/L or ug/Kg) UG/KG	Q
74-87-3	Chloromethane	16000	U
74-83-9	Bromomethane	16000	U
75-01-4	Vinyl Chloride	16000	U
75-00-3	Chloroethane	16000	U
75-09-2	Methylene Chloride	28000	B
67-64-1	Acetone	16000	U
75-15-0	Carbon Disulfide	8000	U
75-35-4	1,1-Dichloroethene	8000	U
75-34-3	1,1-Dichloroethane	8000	U
540-59-0	1,2-Dichloroethene (total)	8000	U
67-66-3	Chloroform	8000	U
107-06-2	1,2-Dichloroethane	8000	U
78-93-3	2-Butanone	16000	U
71-55-6	1,1,1-Trichloroethane	8000	U
56-23-5	Carbon Tetrachloride	8000	U
108-05-4	Vinyl Acetate	16000	U
75-27-4	Bromodichloromethane	8000	U
78-87-5	1,2-Dichloropropane	8000	U
10061-01-5	Trans-1,3-Dichloropropene	8000	U
79-01-6	Trichloroethene	8000	U
124-48-1	Dibromochloromethane	8000	U
79-00-5	1,1,2-Trichloroethane	8000	U
71-43-2	Benzene	8000	U
10061-02-6	cis-1,3-Dichloropropene	8000	U
75-25-2	Bromoform	8000	U
591-78-6	2-Hexanone	16000	U
108-10-1	4-Methyl-2-Pentanone	16000	U
127-18-4	Tetrachloroethene	8000	U
79-34-5	1,1,2,2-Tetrachloroethane	16000	U
108-88-3	Toluene	8000	U
108-90-7	Chlorobenzene	8000	U
100-41-4	Ethylbenzene	8000	U
100-42-5	Styrene	8000	U
1330-20-7	Total Xylenes	8000	U

REFERENCE NO. 24

SITE NAME: AIRCRAFT PAINTING, INC.
TDD#: 02-8805-04
SAMPLING DATE: 08/02/88
EPA CASE NO.: 10155
LAB NAME: JTC ENVIRONMENTAL

INORGANICS												
Sample ID No.	NJ88-SW-1(MS/MSD)	NJ88-SED-1(MS/MSD)	NJ88-SW-2	NJ88-SED-2	NJ88-SW-3(DUP)	NJ88-SED-3(DUP)	NJ88-GW-1	NJ88-GW-2	NJ88-TA-1	NJ88-RIN-1	NJ88-RIN-2	NJ88-TBLK-1
Traffic Report No.	MB0704	MB0701	MB0705	MB0702	MB0706	MB0703	MB0707	MB0708	MB0700	MB0710	MB0711	N/A
Matrix	WATER	SEDIMENT	WATER	SEDIMENT	WATER	SEDIMENT	WATER	WATER	WATER	WATER	WATER	N/A
Units	ug/L	mg/kg	ug/L	mg/kg	ug/L	mg/kg	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L
Aluminum	11400 E	383	7050 E	R	7660 E	R			1640			NR
Antimony	60.9				75				4630			NR
Arsenic		J		J		J						NR
Barium	J	J	260	J	J	J	J	J	J			NR
Beryllium	J			J		J	J	J			J	NR
Cadmium	70.7	5.1	85.4	R	80.2	R	J	6.2	1320 E			NR
Calcium	J	1670	7050	1690	5900	1710	J	J	9930			NR
Chromium	2630 E	47.1	2400 E	12.8	1820 E	47.9			176000			NR
Cobalt			J		J				112			NR
Copper	137	8.8	R	J	R	7.8	99	33.7	2860			NR
Iron	20400 E	376	43300 E	155	37500 E	398	452 E	J	2720			NR
Lead	155	1370	R	243	R	419	12.1	5.3	1050			NR
Magnesium		J	J	J	J	J	J	J	J			NR
Manganese	42	10.7	216	7.9	335	7.1	16.9		28.3		J	NR
Mercury								1.1 E	R			NR
Nickel	J	J	518		410	J						NR
Potassium	J	J	J	J	J	J	J	J	26200	J	J	NR
Selenium					17.8				R			NR
Silver	15.4				J				12.2 E			NR
Sodium									197000			NR
Thallium												NR
Vanadium					J				R			NR
Zinc	434	61.3	R	R	R	R	1220	86.9	8370			NR

NOTES:
Blank space - compound analyzed for but not detected
E - estimated value
J - estimated value, compound present below CRDL but above IDL
R - analysis did not pass EPA QA/QC
NR - analysis not required

Title: Evaluation of Metals Data for the Contract Laboratory Program
Appendix A.2: Data Acceptability Narrative

Date: Feb. 1988
Number: HW-2
Revision: 7

Inorganics

Case# 10155   Site AIRCRAFT PAINTING   Matrix: Soil 3
Lab JTC   Water 8
Other —

A.2.1 **Are all data of acceptable quality?** Yes ____ No ✓

If no, list exceptions with reason(s) for rejection or qualification as estimated value (J).

1) The following analyte is qualified as rejected (red-lined) because the Spiked Sample Recovery is outside control limits. V → MBQ-700

2) The following analytes are qualified as estimated (flagged with "J") because the Spiked Sample Recovery is outside control limits.
Ag → MBQ-700 Se → MBQ-706 Hg → MBQ-708

3) The following analytes are qualified as rejected (red-lined) because Lab Duplicates are outside control limits. Hg, Se → MBQ-700

4) The following analytes are qualified as rejected (red-lined) because the Field Duplicates are outside control limits.
~~Al, Cd, Cu → MBQ-705,706 Pb, Zn → MBQ-702,703~~ JB 10/19/88
Al, Cd, Zn → MBQ-702,703 Cu, Pb, Zn → MBQ-705,706

.2.1 (continuation)

.2.2 **Contract Problems/Non-compliance**

1) "U" values for Aluminum and Mercury on summary sheets (Forms 1,3,6,9) are different from those on Form Eleven — Instrument Detection Limits (Quarterly)

MMB Reviewer: ______________________ **Date:** ______________
Signature

Contractor Reviewer: John Balicky **Date:** Oct. 3, 1988
Signature

Verified by: Hanif Sheikh **Date:** 10-21-88

COVER PAGE - INORGANIC ANALYSES DATA PACKAGE

Name: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

Code: JTC Case No.: 10155 SAS No.: SDG No.: MBQ700

No.: 7/87

EPA Sample No.	Lab Sample ID.
MBQ700	740557
MBQ700D	740557D
MBQ700S	740557S
MBQ701	740558
MBQ701D	740558D
MBQ701S	740558S
MBQ702	740559
MBQ703	740560
MBQ704	740561
MBQ704D	740561D
MBQ704S	740561S
MBQ705	740562
MBQ706	740563
MBQ707	740564
MBQ708	740565
MBQ710	740566
MBQ711	740567
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e ICP interelement corrections applied? Yes/No NO

e ICP background corrections applied? Yes/No YES
If yes-were raw data generated before
application of background corrections? Yes/No NO

ments:

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ease of the data contained in this hardcopy data package and in the puter-readable data submitted on floppy diskette has been authorized by oratory Manager or the Manager's designee, as varified by the lowing signature.

Lab Manager: ____________________

Date: 09/07/88

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ704

Name: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

Code: JTC Case No.: 10155 SAS No.: SDG No.: MBQ700

ix (soil/water): WATER Lab Sample ID: 740561

) (low/med): LOW Date received: 08/04/88

lids: .0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	11400.0		*E	P
7440-36-0	Antimony	60.9			P
7440-38-2	Arsenic	3.9	U		F
7440-39-3	Barium	42.3	B		P
7440-41-7	Beryllium	1.9	B		P
7440-43-9	Cadmium	70.7			P
7440-70-2	Calcium	1050.0	B		P
7440-47-3	Chromium	2630.0		E	P
7440-48-4	Cobalt	7.2	U		P
7440-50-8	Copper	137.0			P
7439-89-6	Iron	20400.0		*E	P
7439-92-1	Lead	155.0		S	F
7439-95-4	Magnesium	495.0	U		P
7439-96-5	Manganese	42.0			P
7439-97-6	Mercury	.20	U	N	CV
7440-02-0	Nickel	35.0	B		P
7440-09-7	Potassium	2040.0	B		A
7782-49-2	Selenium	3.1	U		F
7440-22-4	Silver	15.4			P
7440-23-5	Sodium	2870.0	U		P
7440-28-0	Thallium	1.7	U	W	F
7440-62-2	Vanadium	14.0	U		P
7440-66-6	Zinc	434.0		*	P
	Cyanide				NR

r Before: COLORLESS Clarity Before: CLEAR Texture:

r After: COLORLESS Clarity After: CLEAR Artifacts:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ701

Name: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

Code: JTC Case No.: 10155 SAS No.: SDG No.: MBQ700

ix (soil/water): SOIL Lab Sample ID: 740558

el (low/med): LOW Date received: 08/04/88

ids: 75.0

Concentration Units (ug/L or mg/Kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	383.0			P
7440-36-0	Antimony	15.5	U		P
7440-38-2	Arsenic	1.9	B		F
7440-39-3	Barium	12.2	B		P
7440-41-7	Beryllium	.21	U		P
7440-43-9	Cadmium	5.1			P
7440-70-2	Calcium	1670.0			P
7440-47-3	Chromium	47.1			P
7440-48-4	Cobalt	1.9	U		P
7440-50-8	Copper	8.8			P
7439-89-6	Iron	376.0			P
7439-92-1	Lead	1370.0			F
7439-95-4	Magnesium	260.0	B		P
7439-96-5	Manganese	10.7			P
7439-97-6	Mercury	.13	U		CV
7440-02-0	Nickel	7.9	B		P
7440-09-7	Potassium	506.0	B		A
7782-49-2	Selenium	.83	U		F
7440-22-4	Silver	3.2	U		P
7440-23-5	Sodium	765.0	U		P
7440-28-0	Thallium	.45	U		F
7440-62-2	Vanadium	3.7	U		P
7440-66-6	Zinc	61.3		*	P
	Cyanide				NR

r Before: BROWN Clarity Before: Texture: MEDIUM

r After: COLORLESS Clarity After: Artifacts:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ705

Name: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

ode: JTC Case No.: 10155 SAS No.: SDG No.: MBQ700

x (soil/water): WATER Lab Sample ID: 740562

el (low/med): LOW Date received: 08/04/88

: ids: .0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7050.0		*E	P
7440-36-0	Antimony	58.0	U		P
7440-38-2	Arsenic	3.9	U		F
7440-39-3	Barium	260.0			P
7440-41-7	Beryllium	.80	U		P
7440-43-9	Cadmium	85.4			P
7440-70-2	Calcium	7050.0			P
7440-47-3	Chromium	2400.0		E	P
7440-48-4	Cobalt	40.5	B		P
7440-50-8	Copper	~~446.0~~			P
7439-89-6	Iron	43300.0		*E	P
7439-92-1	Lead	~~22.7~~		S	F
7439-95-4	Magnesium	2920.0	B		P
7439-96-5	Manganese	216.0			P
7439-97-6	Mercury	.20	U	N	CV
7440-02-0	Nickel	518.0			P
7440-09-7	Potassium	1750.0	B		A
7782-49-2	Selenium	3.1	U		F
7440-22-4	Silver	8.2	U		P
7440-23-5	Sodium	2870.0	U		P
7440-28-0	Thallium	1.7	U		F
7440-62-2	Vanadium	14.0	U		P
7440-66-6	Zinc	~~3360.0~~		*	P
	Cyanide				NR

or Before: COLORLESS Clarity Before: CLEAR Texture:

After: COLORLESS Clarity After: CLEAR Artifacts:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ702

ıme: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

ıde: JTC Case No.: 10155 SAS No.: SDC No.: MBQ700

: (soil/water): SOIL Lab Sample ID: 740559

(low/med): LOW Date received: 08/04/88

ds: 76.5

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	~~142.0~~			P
7440-36-0	Antimony	15.2	U		P
7440-38-2	Arsenic	2.2	B		F
7440-39-3	Barium	5.4	B		P
7440-41-7	Beryllium	1.3	B		P
7440-43-9	Cadmium	~~2.1~~			P
7440-70-2	Calcium	1690.0			P
7440-47-3	Chromium	12.8			P
7440-48-4	Cobalt	1.9	U		P
7440-50-8	Copper	6.1	B		P
7439-89-6	Iron	155.0			P
7439-92-1	Lead	243.0			F
7439-95-4	Magnesium	219.0	B		P
7439-96-5	Manganese	7.9			P
7439-97-6	Mercury	.13	U		CV
7440-02-0	Nickel	4.2	U		P
7440-09-7	Potassium	496.0	B		A
7782-49-2	Selenium	.81	U		F
7440-22-4	Silver	2.1	U		P
7440-23-5	Sodium	750.0	U		P
7440-28-0	Thallium	.44	U		F
7440-62-2	Vanadium	3.7	U		P
7440-66-6	Zinc	~~25.5~~		*	P
	Cyanide				NR

Before: BROWN Clarity Before: Texture: MEDIUM

After: COLORLESS Clarity After: Artifacts:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ706

JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

e: JTC Case No.: 10155 SAS No.: SDG No.: MBQ700

:oil/water): WATER Lab Sample ID: 740563

low/med): LOW Date received: 08/04/88

.0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	7660.0		*E	P
7440-36-0	Antimony	75.0			P
7440-38-2	Arsenic	3.9	U		F
7440-39-3	Barium	130.0	B		P
7440-41-7	Beryllium	.80	U		P
7440-43-9	Cadmium	80.2			P
7440-70-2	Calcium	5900.0			P
7440-47-3	Chromium	1820.0		E	P
7440-48-4	Cobalt	38.0	B		P
7440-50-8	Copper	~~169.0~~			P
7439-89-6	Iron	37500.0		*E	P
7439-92-1	Lead	~~78.5~~			F
7439-95-4	Magnesium	3790.0	B		P
7439-96-5	Manganese	335.0			P
7439-97-6	Mercury	.20	U	N	CV
7440-02-0	Nickel	410.0			P
7440-09-7	Potassium	2040.0	B		A
7782-49-2	Selenium	17.8			F
7440-22-4	Silver	9.5	B		P
7440-23-5	Sodium	2870.0	U		P
7440-28-0	Thallium	1.7	U		F
7440-62-2	Vanadium	37.3	B		P
7440-66-6	Zinc	~~846.0~~		*	P
	Cyanide				NR

l :fore: COLORLESS Clarity Before: CLEAR Texture:

After: COLORLESS Clarity After: CLEAR Artifacts:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ703

Name: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

Code: JTC Case No.: 10155 SAS No.: SDG No.: MBQ700

ix (soil/water): SOIL Lab Sample ID: 740560

l (low/med): LOW Date received: 08/04/88

lids: 75.7

Concentration Units (ug/L or mg/kg dry weight): MG/KG

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	~~872.0~~			P
7440-36-0	Antimony	15.3	U		P
7440-38-2	Arsenic	2.5	B		F
7440-39-3	Barium	9.4	B		P
7440-41-7	Beryllium	.32	B		P
7440-43-9	Cadmium	~~6.0~~			P
7440-70-2	Calcium	1710.0			P
7440-47-3	Chromium	47.9			P
7440-48-4	Cobalt	1.9	U		P
7440-50-8	Copper	7.8			P
7439-89-6	Iron	398.0			P
7439-92-1	Lead	419.0			F
7439-95-4	Magnesium	310.0	B		P
7439-96-5	Manganese	7.1			P
7439-97-6	Mercury	.13	U		CV
7440-02-0	Nickel	10.3	B		P
7440-09-7	Potassium	463.0	B		A
7782-49-2	Selenium	.82	U		F
7440-22-4	Silver	2.2	U		P
7440-23-5	Sodium	758.0	U		P
7440-28-0	Thallium	.45	U	W	F
7440-62-2	Vanadium	3.7	U		P
7440-66-6	Zinc	~~41.8~~		*	P
	Cyanide				NR

r Before: BROWN Clarity Before: Texture: MEDIUM

r After: COLORLESS Clarity After: Artifacts:

ents:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ707

: e: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

ode: JTC Case No.: 10155 SAS No.: SDG No.: MBQ700

(soil/water): WATER Lab Sample ID: 740564

(low/med): LOW Date received: 08/04/88

ids: .0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	169.0	U	*E	P
7440-36-0	Antimony	58.0	U		P
7440-38-2	Arsenic	3.9	U		F
7440-39-3	Barium	33.4	B		P
7440-41-7	Beryllium	1.9	B		P
7440-43-9	Cadmium	3.9	B		P
7440-70-2	Calcium	441.0	B		P
7440-47-3	Chromium	6.9	U	E	P
7440-48-4	Cobalt	7.2	U		P
7440-50-8	Copper	99.0			P
7439-89-6	Iron	452.0		*E	P
7439-92-1	Lead	12.1			F
7439-95-4	Magnesium	833.0	B		P
7439-96-5	Manganese	16.9			P
7439-97-6	Mercury	.20	U	N	CV
7440-02-0	Nickel	16.0	U		P
7440-09-7	Potassium	1460.0	B		A
7782-49-2	Selenium	3.1	U		F
7440-22-4	Silver	8.2	U		P
7440-23-5	Sodium	2870.0	U		P
7440-28-0	Thallium	1.7	U		F
7440-62-2	Vanadium	14.0	U		P
7440-66-6	Zinc	1220.0		*	P
	Cyanide				NR

Before: COLORLESS Clarity Before: CLEAR Texture:

or After: COLORLESS Clarity After: CLEAR Artifacts:

nts:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ708

Name: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

Code: JTC Case No.: 10155 SAS No.: SDG No.: MBQ700

ix (soil/water): WATER Lab Sample ID: 740565

l (low/med): LOW Date received: 08/04/88

lids: .0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	169.0	U	*E	P
7440-36-0	Antimony	58.0	U		P
7440-38-2	Arsenic	3.9	U		F
7440-39-3	Barium	19.9	B		P
7440-41-7	Beryllium	3.0	B		P
7440-43-9	Cadmium	6.2			P
7440-70-2	Calcium	1230.0	B		P
7440-47-3	Chromium	6.9	U	E	P
7440-48-4	Cobalt	7.2	U		P
7440-50-8	Copper	33.7			P
7439-89-6	Iron	46.0	B	*E	P
7439-92-1	Lead	5.3		S	F
7439-95-4	Magnesium	809.0	B		P
7439-96-5	Manganese	6.1	U		P
7439-97-6	Mercury	1.1	J	N	CV
7440-02-0	Nickel	16.0	U		P
7440-09-7	Potassium	1320.0	B		A
7782-49-2	Selenium	3.1	U		F
7440-22-4	Silver	9.2	U		P
7440-23-5	Sodium	2870.0	U		P
7440-28-0	Thallium	1.7	U		F
7440-62-2	Vanadium	14.0	U		P
7440-66-6	Zinc	96.9		*	P
	Cyanide				NR

r Before: COLORLESS Clarity Before: CLEAR Texture:

r After: COLORLESS Clarity After: CLEAR Artifacts:

ments:

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INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ700

e: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

e: JTC Case No.: 10155 SAS No.: SDC No.: MBQ700

(soil/water): WATER Lab Sample ID: 740557

low/med): MED Date received: 08/04/88

s: .0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	1640.0			P
7440-36-0	Antimony	4630.0			P
7440-38-2	Arsenic	3.9	U	W	F
7440-39-3	Barium	18.0	B		P
7440-41-7	Beryllium	.80	U		P
7440-43-9	Cadmium	1320.0		E	P
7440-70-2	Calcium	9930.0			P
7440-47-3	Chromium	176000.0		E	P
7440-48-4	Cobalt	112.0			P
7440-50-8	Copper	2860.0			P
7439-89-6	Iron	2720.0			P
7439-92-1	Lead	1050.0		* S	F
7439-95-4	Magnesium	1470.0	B		P
7439-96-5	Manganese	28.3			P
7439-97-6	Mercury	~~.74~~		*	CV
7440-02-0	Nickel	16.0	U		P
7440-09-7	Potassium	26200.0			A
7782-49-2	Selenium	~~6.0~~	J	N*	F
7440-22-4	Silver	12.2	J	N	P
7440-23-5	Sodium	197000.0			P
7440-28-0	Thallium	1.7	U		F
7440-62-2	Vanadium	~~14.0~~	U	N	P
7440-66-6	Zinc	8370.0			P
	Cyanide				NR

Before: BROWN Clarity Before: CLOUDY Texture:

After: GREEN Clarity After: CLOUDY Artifacts:

ts:

FORM I - IN 7/87

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ710

Name: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

Code: JTC Case No.: 10155 SAS No.: SDG No.: MBQ700

ix (soil/water): WATER Lab Sample ID: 740566

l (low/med): LOW Date received: 08/04/88

lids: .0

Concentration Units (ug/L or mg/kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	169.0	U	*E	P
7440-36-0	Antimony	58.0	U		P
7440-38-2	Arsenic	3.9	U		F
7440-39-3	Barium	11.0	U		P
7440-41-7	Beryllium	.80	U		P
7440-43-9	Cadmium	3.7	U		P
7440-70-2	Calcium	403.0	U		P
7440-47-3	Chromium	6.9	U	E	P
7440-48-4	Cobalt	7.2	U		P
7440-50-8	Copper	22.0	U		P
7439-89-6	Iron	30.0	U	*E	P
7439-92-1	Lead	.90	U		F
7439-95-4	Magnesium	495.0	U		P
7439-96-5	Manganese	6.1	U		P
7439-97-6	Mercury	.20	U	N	CV
7440-02-0	Nickel	16.0	U		P
7440-09-7	Potassium	883.0	B		A
7782-49-2	Selenium	3.1	U		F
7440-22-4	Silver	8.2	U		P
7440-23-5	Sodium	2870.0	U		P
7440-28-0	Thallium	1.7	U		F
7440-62-2	Vanadium	14.0	U		P
7440-66-6	Zinc	12.0	U	*	P
	Cyanide				NR

or Before: COLORLESS Clarity Before: CLEAR Texture:

or After: COLORLESS Clarity After: CLEAR Artifacts:

ments:

U.S. EPA - CLP

1

INORGANIC ANALYSIS DATA SHEET

EPA SAMPLE NO.

MBQ711

lame: JTC ENVIRONMENTAL CNSLTS. Contract: 68-W8-0023

Code: JTC Case No.: 10155 SAS No.: SDC No.: MBQ700

ix (soil/water): WATER Lab Sample ID: 740567

l (low/med): LOW Date received: 08/04/88

lids: .0

Concentration Units (ug/L or mg/Kg dry weight): UG/L

CAS No.	Analyte	Concentration	C	Q	M
7429-90-5	Aluminum	169.0	U	*E	P
7440-36-0	Antimony	58.0	U		P
7440-38-2	Arsenic	3.9	U		F
7440-39-3	Barium	11.0	U		P
7440-41-7	Beryllium	1.3	B		P
7440-43-9	Cadmium	3.7	U		P
7440-70-2	Calcium	403.0	U		P
7440-47-3	Chromium	6.9	U	E	P
7440-48-4	Cobalt	7.2	U		P
7440-50-8	Copper	22.0	U		P
7439-89-6	Iron	30.0	U	*E	P
7439-92-1	Lead	.90	U		F
7439-95-4	Magnesium	495.0	U		P
7439-96-5	Manganese	7.1	B		P
7439-97-6	Mercury	.20	U	N	CV
7440-02-0	Nickel	16.0	U		P
7440-09-7	Potassium	1610.0	B		A
7782-49-2	Selenium	3.1	U		F
7440-22-4	Silver	8.2	U		P
7440-23-5	Sodium	2870.0	U		P
7440-28-0	Thallium	1.7	U		F
7440-62-2	Vanadium	14.0	U		P
7440-66-6	Zinc	12.0	U	*	P
	Cyanide				NR

or Before: COLORLESS Clarity Before: CLEAR Texture:

or After: COLORLESS Clarity After: CLEAR Artifacts:

ments:

REFERENCE NO. 25

ERP No. D-MMS-A02224-00, Rating EO2, 1989 Central and Western Planning Areas Gulf of Mexico Outer Continental Shelf (OCS) Oil and Gas Sales No. 118 and 122, Lease Offerings offshore the coast of Alabama, Mississippi, Louisiana and Texas.

Summary

EPA expressed objections to the proposed action of unrestricted leasing in the Central and Western Gulf. EPA also expressed concern over the lack of any proposed mitigation for possible impacts to deep-water benthic communities. EPA also expressed concern that ozone modeling of the effect of offshore emission on onshore air quality be conducted.

ERP No. D-NPS-K61095-NV, Rating LO, Death Valley National Monument, General Management Plan, Implementation, Inyo and San Bernardino Counties, CA and Nye and Esmeralda Counties, NV.

Summary

EPA expressed a lack of objections to the proposed management plan but noted that future multiple use activities (mining, campgrounds) will require an assessment of air quality, surface water and ground water impacts.

Final EISs

ERP No. F-COE-H30000-IA, Des Moines Recreational River and Greenbelt Area, Development, Operation and Maintenance, Des Moines River, Webster, Hamilton, Boone, Dallas, Polk, and Warren Counties, IA.

Summary

EPA has no objections to this project with the understanding that each unit of the project will be evaluated separately for NEPA compliance at a later date.

ERP No. F-FHW-F40290-WI, WI-TH-83 Improvement, I-94 to Cardinal Lane/WI-TH-16, Funding and 404 Permit, Waukesha County, WI.

Summary

EPA has no objection to this project, long as a minimum of 0.8 acre of additional wetlands are created.

(Note: The above summary should have appeared in the 6-10-88 Federal Register Notice.)

ERP No. F-USN-C85041-NJ, Colts Neck, Naval Weapons Station Earle Family Housing Development, Construction, Mammouth County, NJ.

Summary

EPA's concern regarding the location of the mitigation site has been information within the document clarified our questions with respect to the delineation of wetlands, and the point of discharge of the wastewater treatment plant. Accordingly, EPA has no unresolved concerns regarding the implementation of the project as proposed.

ERP No. F-USN-D84005-VA, Empress II Operation, Electromagnetic Pulse, Radiation Environment Simulator for Ships, Chesapeake Bay (West of Bloodsworth Island) and Atlantic Ocean (Virginia Capes Operating Area), off the Coast of VA.

Summary

EPA expressed a preference for the proposed site and requested a thorough monitoring program for the project.

(Note: The above summary should have appeared in the 6-17-88 Federal Register Notice.)

Dated: June 21, 1988.

William D. Dickerson,

Deputy Director, Office of Federal Activities.

[FR Doc. 88-14353 Filed 6-23-88; 8:45 am]

BILLING CODE 6560-50-M

[ER-FRL-3404-3]

Environmental Impact Statements; Availability; Weekly Receipts

Responsible Agency: Office of Federal Activities, General Information (202) 382-5073 or (202) 382-5075. Availability of Environmental Impact Statements, Filed June 13, 1988 Through June 17, 1988, Pursuant to 40 CFR 1506.9.

EIS No. 880189, Draft, BLM, AZ, San Pedro River Riparian Resource Management Plan, Implementation, San Simon Resource Area, Safford District, Cochise County, AZ, Due: September 21, 1988, Contact: Jerrold Coolidge (602) 428-4040.

EIS No. 880190, Draft, DOE, ND, Charlie Creek-Belfield 345 kV Transmission Line Project, Construction, Operation and Maintenance, Implementation, Billings, Stark, McKenzie and Dunn Counties, ND, Due: August 8, 1988, Contact: James D. Davis (406) 657-5525.

EIS No. 880191, Draft, SCS, MD, East Yellow Creek Watershed, Soil Erosion and Flood Damage Reduction Plan, Funding and Implementation, Sullivan, Linn and Chariton Counties, MO, Due: August 8, 1988, Contact: Russell C. Mills (314) 875-5214.

EIS No. 880192, Draft, NPS, AK, Denali National Park and Preserve, Wilderness Recommendations, Designation or Nondesignation, AK, Due: August 29, 1988, Contact: Linda Nebel (907) 257-

EIS No. 880193, Draft, AFS, WY, Little Bighorn River, Wild and Scenic River Study, National Wild and Scenic Rivers System, Designation, Bighorn National Forest, Sheridan County, WY, Due: September 22, 1988, Contact: Arthur Bauer (307) 672-0751.

EIS No. 880194, Draft, USN, PA, U.S. Navy Girard Point Site, Sale to the Philadelphia Muncipal Authority for the Establishment of a Steam Generation Facility that Produces Steam for Purchase by the U.S. Navy, City of Philadelphia, PA, Due: August 12, 1988, Contact: Kenneth Petrone (215) 897-6431.

EIS No. 880195, Final, FHW, PA, PA-23/New Holland Avenue/LR-1124, Section B01 Relocation, US 30 to Walnut and Chestnut Streets, Funding and 404 Permit, Manheim, East Lampeter and Lancaster Townships and the City of Lancaster, Lancaster County, PA, Due: July 25, 1988, Contact: Philibert A. Quellet (717) 782-4422.

EIS No. 880196, Draft, FRC, REG, Regulations Governing Independent Power Producers (RM88-4-000) and Regulations Governing Bidding Programs (RM88-5-000), Implementation, Due: August 15, 1988, Contact: Gilda Rodriquez (202) 357-9155.

EIS No. 880197, Draft, SCS, MS, Whites Creek, Watershed Protection and Flood Prevention Plan, Funding, Possible 404 Permit and Implementation, Webster County, MS, Due: August 8, 1988, Contact: L. Peter Heard (601) 965-5205.

EIS No. 880198, Draft, EPA, FL, CF Mining Complex II, Open Pit Phosphate Mine and Beneficiation Plan, Construction and Operation, NPDES and 404 Permits, Hardee County, FL, Due: August 8, 1988, Contact: Maryann Gerber (404) 347-3776.

Dated: June 21, 1988.

William D. Dickerson,

Deputy Director, Office of Federal Activities.

[FR Doc. 88-14352 Filed 6-23-88; 8:45 am]

BILLING CODE 6560-50-M

[FRL-3340-F]

New Jersey Coastal Plain Aquifer System, New Jersey Sole Source Aquifer Final Determination

AGENCY: U.S. Environmental Protection Agency.

ACTION: Notice.

SUMMARY: Notice is hereby given that, pursuant to section 1424(e) of the Safe Drinking Water Act, the Administrator of the U.S. Environmental Protection

New Jersey Coastal Plain Aquifer System, underlying the New Jersey Coastal Plan Area, is the sole or principal source of drinking water for the Counties of Monmouth, Burlington, Ocean, Camden, Gloucester, Atlantic, Salem, Cumberland, Cape May and portions of Mercer and Middlesex Counties, New Jersey, and that the acquifer, if contaminated, would create a significant hazard to public health. As a result of this action EPA will review. Federally-assisted projects (projects which receive Federal financial assistance through a grant, contract, loan guarantee, or otherwise) proposed for construction in a project review area which includes the New Jersey Coastal Plain Area and a portion of the aquifer streamflow source zone. The streamflow source zone includes upstream portions of the Delaware River Basin in the States of Delaware, New Jersey, New York and Pennsylvania. Federally-assisted projects will be reviewed to ensure that they are designed and constructed so that they do not create a significant hazard to public health. Projects outside of the project review area but within the streamflow source zone will be reviewed if they require an Environmental Impact Statement (EIS).

DATES: This determination shall be promulgated for purposes of judicial review at 1:00 P.M. Eastern Time on July 7, 1988. This determination shall become effective on August 8, 1988.

ADDRESSES: The data on which these findings are based, detailed maps of the New Jersey Coastal Plain Area and the project review area, a compilation of public comments and the Agency's response to those comments, are available to the public and may be inspected during normal business hours at the U.S. Environmental Protection Agency, Water Management Division, 26 Federal Plaza, New York, New York 10278. In addition, copies of a map showing the designated area and a responsiveness summary to public comment are available upon request.

FOR FURTHER INFORMATION CONTACT: John Malleck, Chief, Office of Ground Water Management, Water Management Division, 26 Federal Plaza, New York, New York 10278 (212) 264–5635.

SUPPLEMENTARY INFORMATION: Notice is hereby given that pursuant to section 1424(e) of the Safe Drinking Water Act (42 U.S.C., 300f, 300h–3(e), Pub. L. 93–523), the Administrator of the U.S. Environmental Protection Agency (EPA) has determined that the New Jersey Coastal Plain Aquifer System, underlying the New Jersey Coastal Plain Area, is the sole or principal source of drinking water for the Counties of Monmouth, Burlington, Ocean, Camden, Gloucester, Atlantic, Salem, Cumberland, Cape May and portions of Mercer and Middlesex Counties, New Jersey. Pursuant to section 1424(e), Federally-assisted projects proposed for construction in the New Jersey Coastal Plain Area and the project review area within portions of its streamflow source zone will be subject to EPA review. The streamflow source zone for the New Jersey Coastal Plain Aquifer System includes upstream portions of the Delaware River Basin in the States of Delaware (New Castle County), New Jersey (Mercer-part, Hunterdon-part, Sussex-part, and Warren Counties), New York (Delaware, Orange, Sullivan and Ulster Counties), and Pennsylvania (Berks-part, Bucks, Carbon-part, Chester-part, Delaware, Lackawanna-part, Lancaster, Lehigh, Luzerne-part, Monroe Montgomery, Northampton, Philadelphia, Pike, Schuykill and Wayne Counties). The project review area includes that portion of the streamflow source zone which lies within two miles of the Delaware River in the States of New Jersey (in Mercer, Hunterdon, Sussex and Warren Counties), Delaware (in New Castle County), Pennsylvania (in Delaware, Philadelphia, Bucks, Monroe, Northampton, Pike and Wayne Counties) and New York (in Delaware, Orange and Sullivan Counties).

I. Background

Section 1424(e) of the Safe Drinking Water Act states: (e) If the Administrator determines, on his own initiative or upon petition, that an area has an aquifer which is the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health, he shall publish notice of that determination in the Federal Register. After the publication of any such notice no commitment for Federal financial assistance (through a grant, contract, loan guarantee, or otherwise) may be entered into for any project which the Administrator determines may contaminate such aquifer through a recharge zone so as to create a significant hazard to public health, but a commitment for Federal financial assistance may, if authorized under another provision of law, be entered into to a plan or design the project to assure that it will not so contaminate the aquifer.

On December 4, 1978 the Environmental Defense Fund, Inc. and the Sierra Club New Jersey Chapter petitioned the EPA Administrator to determine that the Counties of Monmouth, Burlington, Ocean, Camden, Gloucester, Atlantic, Salem, Cumberland, Cape May and portions of Mercer and Middlesex Counties, New Jersey, constitute an area whose aquifer system is "the sole or principal drinking water source for the area and which, if contaminated, would create a significant hazard to public health." On March 21, 1979, EPA published the petition in the Federal Register. Public hearings on the petition request were held May 1, 15 and 17, 1979 in Lindenwold, Trenton, Freehold and Pomona, New Jersey. A May 19, 1983 Federal Register notice announced the availability of additional technical information and the extension of public comment period to July 15, 1983.

II. Basis for Determination

Among the factors to be considered by the Administrator in connection with the designation of an area under section 1424(e) are:

(1) Whether the aquifer is the area's sole or principal source of drinking water and (2) whether contamination of the aquifer would create a significant hazard to public health.

On the basis of information available to this Agency, the Administrator has made the following findings, which are the basis for the determination noted above:

(1) The New Jersey Coastal Plain Area depends upon the underlying Coastal Plain Aquifer System for seventy-five (75) per cent or more of its drinking water to serve 3 million people.

(2) Data show that the formations of the New Jersey Coastal Plain Area are hydrologically interconnected such that they respond collectively as an interrelated aquifer system.

(3) If the aquifer system were to become contaminated, exposure of the persons served by the system would constitute a significant hazard to public health.

(4) Alternative supplies capable of providing fifty (50) per cent or more of the drinking water to the designated area are not available at similar economic costs.

The New Jersey Coastal Plain Aquifer System is highly susceptible to contamination through its recharge zone from a number of sources, including but not limited to, chemical spills, leachate from landfills, stormwater runoff, highway de-icing, faulty septic systems wastewater treatment systems and waste disposal lagoons. The aquifer is also susceptible to contamination to a lesser degree from the same sources. through its streamflow source zone. Since ground-water contamination can completely and since the acquifer in this area is solely or principally relied upon for drinking water purposes by the population of the New Jersey Coastal Plain Area, contamination of the aquifer could pose a significant hazard to public health.

III. Description of the New Jersey Coastal Plain Area Aquifer System, Its Recharge Zone and Its Streamflow Source Zone

The New Jersey Coastal Plain Aquifer System consists of a wedge-shaped mass of unconsolidated sediments composed of clay, silt, sand and gravel. The wedge thins to a feathered edge along the Fall Line and attains a thickness of over 6,000 feet at the tip of Cape May County, New Jersey.

These sediments range in age from Cretaceous to Holocene and can be classified as continental, coastal or marine deposits. There are five major aquifers within the Coastal Plain Aquifer System. They are the Potomac-Raritan-Magothy Aquifer System, Englishtown Aquifer, Wenonah-Mount Laurel Aquifer, Kirkwood Aquifer and the Cohansey Aquifer. Natural recharge to the New Jersey Coastal Plain Aquifer System occurs primarily through direct precipitation on the outcrop area of the geologic formations. A smaller component of natural recharge to the deeper layers of the system occurs by vertical leakage from the upper layers. This accounts for a small percentage of the total amount of recharge; however, over a large area and a long period of time the amount of water transmitted can be significant.

The New Jersey Coastal Plain Aquifer discharges to the surface through streams, springs and evapotranspiration. Many streams ultimately flow into bays or directly into the ocean. Development of the ground-water reservoir as a water supply source constitutes another discharge component which today accounts for a significant portion of discharge from the overall system. In certain areas (e.g. along the Delaware River) heavy pumping has caused a reversal in the normal discharge from the aquifer (Raritan-Magothy) such that the surface stream (Delaware River) now recharges the aquifer. This phenomenon implies that, in addition to the New Jersey Coastal Plain Area, the Delaware River Basin within Delaware, New Jersey, Pennsylvania and New York must be regarded as a streamflow source zone (an upstream headwaters area which drains into a recharge zone), which flows into the Coastal Plain Area.

IV. Information Utilized in Determination

The information utilized in this determination includes the petition, written and verbal comments submitted by the public, and various technical publications. The above data are available to the public and may be inspected during normal business hours at the U.S. Environmental Protection Agency, Region II, Water Management Division, 26 Federal Plaza, New York, New York 10278.

V. Project Review

When the EPA Administrator publishes his determination for a sole or principal drinking water source, no commitment for Federal financial assistance may be may if the Administrator finds that the Federally-assisted project may contaminate the aquifer through a recharge zone so as to create a significant hazard to public health . . . Safe Drinking Water Act section 1424(e), 42 U.S.C. 300h–3(e). In many cases, these Federally-assisted projects would also be analyzed in an "Environmental Impact Statement" (EIS) under the National Environmental Policy Act (NEPA), 42 U.S.C. 4332(2)(C). All EISs, as well as any other proposed Federal actions affecting an EPA program or responsibility, are required by Federal law (under the so-called "NEPA/309" process) [1] to be reviewed and commented upon by the EPA Administrator. Therefore, in order to streamline EPA's review of the possible environmental impacts on designated aquifers, when an action is analyzed in an EIS, the two reviews will be consolidated, and both authorities will be cited. The EPA review (under the Safe Drinking Water Act) of Federally-assisted projects potentially affecting sole or principal source aquifers, will be included in the EPA review (under the "NEPA/309" process) of any EIS accompanying the same Federally-assisted project. The letter transmitting EPA's comments on the final EIS to the lead agency will be the vehicle for informing the lead agency of EPA's actions under section 1424(e).

All Federally-assisted proposed projects will be reviewed, within the New Jersey Coastal Plain Area (Counties of Monmouth, Burlington, Ocean, Camden, Gloucester, Atlantic, Salem, Cumberland and Cape May, and portions of Mercer and Middlesex Counties, New Jersey (as delineated on maps included in the petition), and that portion of the streamflow source zone which lies within two miles of the Delaware River in the States of New Jersey (in Mercer, Hunterdon, Sussex and Warren Counties), Delaware (in New Castle County), Pennsylvania (in Delaware, Philadelphia, Bucks, Monroe, Northampton, Pike and Wayne Counties) and New York (in Delaware, Orange and Sullivan Counties) (as delineated on maps included in the public record). Outside the New Jersey Coastal Plain Area and further than two miles from the Delaware River in the streamflow source zone, only those Federally-assisted proposed projects requiring the preparation of an EIS will be reviewed. The Agency has chosen a two-mile limit for the project review area along the Delaware River based on the climate and hydrologic setting of the area. The two-mile distance is consistent with the two-mile review radius included in the EPA guidelines for Ground-Water Classification and is protective of human health.

VI. Summary and Discussion of Public Comments

There has been much controversy over the possible designation of this aquifer system. The majority of the comments from the original 1979 public hearings were in direct opposition to such a designation. More than half of all responses received were against designation. Several commenters felt constrained by the original comment period and thereby requested an extension. EPA complied with this request on two occasions, once by announcing at the four public hearings it held throughout the area under consideration that the agency had extended the formal comment period from May 14, 1979, to December 31, 1979, and again in a May 19, 1983 Federal Register Notice that announced the availability of additional information and extension of the public comment period to July 15, 1983. Although a number of ground-water protection measures are available at the Federal, State and local level, none of these, either individually or collectively, permit EPA to act as directly as would a sole source aquifer designation in the review and approval of Federally-assisted projects. In addition, EPA feels that the sole source project review process will foster integration rather than duplication of environmental review efforts. Memoranda of Understanding have been negotiated with various Federal agencies with the purpose of streamlining the review process and minimizing project delays. Most of the

[1] 42 U.S.C. § 7609 requires EPA to conduct this review. The "309" in a "NEPA/309" derives from the original source of this general requirement: Section 309 of the Clean Air Act.

designation would be a duplication of efforts already existing on the state and local levels. Some commenters felt that a sole source aquifer designation would give EPA the power to reject any applications for Federally-funded projects indiscriminately and to delay any project underway. Another main concern of many commenters was that a designation would cause a strong negative economic impact on the area in question and curtail needed development, thus eliminating jobs. EPA is sympathetic to the concerns of the commenters; however, the Agency feels that a sole source aquifer designation would not interfere with economic development. Federal financial assistance will be withheld only in those instances where it is determined that a proposed project may contaminate the acquifer so as to create a significant hazard to public health and no acceptable remedial measures are available to prevent the potential hazard.

Dated: June 16, 1988.

Lee M. Thomas,

Administrator.

[FR Doc. 88-14293 Filed 6-23-88; 8:45 am]

BILLING CODE 6560-50-M

[OPTS-59645; FRL-3404-5]

Toxic and Hazardous Substances; Certain Chemicals Premanufacture Notices

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

SUMMARY: Section 5(a)(1) of the Toxic Substances Control Act (TSCA) requires any person who intends to manufacture or import a new chemical substance to submit a premanufacture notice (PMN) to EPA at least 90 days before manufacture or import commences. Statutory requirements for section 5(a)(1) premanufacture notices are discussed in the final rule published in the Federal Register of May 13, 1983 (48 FR 21722). In the Federal Register of November 11, 1984, (49 FR 46066) (40 CFR 723.250), EPA published a rule which granted a limited exemption from certain PMN requirements for certain types of polymers. Notices for such polymers are reviewed by EPA within 21 days of receipt. This notice announces receipt of nine such PMNs and provides a summary of each.

DATES: Close of Review Periods:

Y 88-192, 88-193—June 5, 1988.
Y 88-194—June 7, 1988.
Y 88-195—May 17, 1988.
Y 88-197—June 14, 1988.
Y 88-198—June 16, 1988.
Y 88-199—June 10, 1988.
Y 88-200—June 23, 1988.

FOR FURTHER INFORMATION CONTACT: Stephanie Roan, Premanufacture Notice Management Branch, Chemical Control Division (TS-794), Office of Toxic Substances, Environmental Protection Agency, Rm. E-611, 401 M Street SW., Washington, DC 20460 (202) 382-3725.

SUPPLEMENTARY INFORMATION: The following notice contains information extracted from the non-confidential version of the submission provided by the manufacturer on the PMNs received by EPA. The complete non-confidential document is available in the Public Reading Room NE-G004 at the above address between 8:00 a.m. and 4:00 p.m., Monday through Friday, excluding legal holidays.

Y 88-192

Manufacturer. Confidential.
Chemical. (G) Hydroxy function acrylic resin.
Use/Production. (S) Coatings. Prod. range: Confidential.

Y 88-193

Manufacturer. Confidential.
Chemical. (G) Polyurethane resin.
Use/Production. (S) Coating. Prod. range: Confidential.

Y 88-194

Manufacturer. Sybron Chemicals Inc.
Chemical. (G) Copolymer of aliphatic esters of 2-propenoic acid with homocyclic and heterocyclic aromatic vinyl compounds, reaction production wiyh aliphatic polyam ne.
Use/Production. (G) Waste and process water purification. Prod. range: Confidential.

Y 88-195

Manufacturer. Confidential.
Chemical. (G) Dibasic acid polyol polyester.
Use/Production. (G) Used in coatings. Prod. range: Confidential.

Y 88-196

Manufacturer. Confidential.
Chemical. (S) Rosin, dicyclopentadiene, dimer fatty acid polymer.
Use/Production. (S) Printing ink vehicles. Prod. range: 3,000,000-3,700,000 kg/yr.

Y 88-197

Manufacturer. Reichhold Chemicals, Inc.
Use/Production. (S) Architectural trade sales coating. Prod. range: Confidential.

Y 88-198

Manufacturer. Confidential.
Chemical. (G) Aliphatic polyester urethane.
Use/Production. (G) Coatings. Prod. range: Confidential.

Y 88-199

Manufacturer. C.J. Osborn.
Chemical. (G) Polyester.
Use/Production. (S) Pigmented and clear finish. Prod. range: Confidential.

Y 88-200

Manufacturer. Confidential.
Chemical. (G) Styrene/acrylic copolymer.
Use/Production. Coatings and inks. Prod. range: Confidential.

Date: June 13, 1988.

Steve Newburg-Rinn,

Acting Chief, Public Data Branch, Information Management Division, Office of Toxic Substances.

[FR Doc. 88-14292 Filed 6-23-88; 8:45 am]

BILLING CODE 6560-50-M

FEDERAL COMMUNICATIONS COMMISSION

Public Information Collection Requirement Submitted to Office of Management and Budget for Review

June 16, 1988.

The Federal Communications Commission has submitted the following information collection requirement to OMB for review and clearance under the Paperwork Reduction Act of 1980 (44 U.S.C. 3507).

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OMB Number: 3060-0025.
Title: Application for Restricted Radiotelephone Operator Permit—Limited Use.
Form Number: FCC 755.
Action: Revision.

REFERENCE NO. 26

GSC-TR8645

GRAPHICAL EXPOSURE MODELING SYSTEM

(GEMS)

USER'S GUIDE

VOLUME 2. MODELING

Prepared for:

U.S. ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF PESTICIDES AND TOXIC SUBSTANCES
EXPOSURE EVALUATION DIVISION
Task No. 3-2
Contract No. 68Ø2397Ø
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Submitted: December 1, 1986

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GEMS> I
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AIRCRAFT PAINTING
LATITUDE 39:22:29 LONGITUDE 75: 4:23 1980 POPULATION

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	0	0	6586	15534	3307	25427
RING TOTALS	0	0	0	6586	15534	3307	25427

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GEMS> I
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AIRCRAFT PAINTING
LATITUDE 39:22:29 LONGITUDE 75: 4:23 1980 HOUSING

KM	0.00-.400	.400-.810	.810-1.60	1.60-3.20	3.20-4.80	4.80-6.40	SECTOR TOTALS
S 1	0	0	0	2194	5877	1180	9251
RING TOTALS	0	0	0	2194	5877	1180	9251

Distance (in miles)	Population	Housing
1/4	0	0
1/2	0	0
1	0	0
2	6586	2194
3	22120	8071
4	25427	9251